

ABSTRACT

Sustainable agriculture is relatively difficult to define. Sustainable agriculture has to be understood as a philosophy, a new way of thinking and living, as well as a new way to use the land (soil) as a basic element of agricultural production. Understanding the phenomenon of farm sustainability or habitat areas must be made on the moral side, too. Sustainable agriculture seeks to ensure that farms remain viable (potentially productive) for future generations.

Currently, at a closer analysis of the contents of sustainable agriculture, it is noted that agriculture has many similarities with "integrated", promoted in Romania during 1970 -1980. Unfortunately, the idea of systematically promoting integrated agriculture was largely undermined, against the background of shortages that have marked the Romanian agriculture in the period that followed. And not least, to meet this problem, to turn this abstract concept of "sustainable development" into something more palpable and to translate it into specific educational measures, the United Nations proclaimed the decade 2005-2014 the Decade "Education for Sustainable Development".

The knowledge of the content regarding the sustainable agriculture systems and its size as organic, biological or biodynamic farming, has aroused the interest of many specialists from Romania, but there are still some unclear issues both conceptually and especially practical to implement this system. As has been stated above, the approach of sustainable agriculture means also the changing farming way of thinking. Because of this, lack of systematic knowledge about this issue raises the acute problem of training the new generation of specialists in agriculture.

Sustainable agriculture for culture of vegetables is welcome; the vegetable growing is the practical activity which can be conducted on surfaces that can run from several hundred square meters to tenths and hundreds of hectares. Hence the suitability of vegetable growing system, regardless of the area and especially investment, which may vary within very large limits, making it easily approached by any interested person, but especially by young people who are less conservative and more interested in promoting the new.

This thesis joins the general preoccupations for optimization of organic fertilizers use in organic vegetables exploitations, aiming at the production obtained from a quantitative and economic point of view and, on the other hand, at minimization of energy input costs and the use of available resources, with habitat conservation and avoiding pollution.

The approach of soil fertilization concepts in organic vegetable growing involves the integration of fertilization in culture technology, with beneficial implications reflected in the economically sustainable production, without risks of harvest pollution and soil degradation. One of the principles of sustainable agriculture is to maintain and improve soil fertility through unconventional methods and techniques. This requires technical solutions to balance the vegetable ecosystem, incorporating all the trophic chains involved with no risks for biodiversity.

This thesis is structured in two parts: the first part presenting the current stage of research regarding the sustainable agriculture and the second part containing the research results structured in two chapters.

The first chapter deals with the main system of sustainable agriculture which has arisen as a reaction to excess of conventional agriculture. The goal of this system is to stop the pollution and erosion of agricultural ecosystems, aiming even at their regeneration and the obtaining of clean agricultural product, unpolluted, in order to maintain a good health of population.

In the second chapter a presentation is made of the general technology of vegetables growing in sustainable system, with the main technological chain. Thus, aspects have been analysed concerning: the choice of land, the preparation works, the crop rotation, the fertilisation of vegetables in sustainable system, the recultivation, etc.

The goal, the research objectives, the methodology and the research material are presented in chapter three.

The purpose of this thesis was to realize a study on the possibilities of obtaining vegetables under the conditions of using sustainable practices in Braila county and it focused on the following major objectives:

Objective 1. Assessment of natural, technical, economic and social resources of Braila county to promote sustainable cultivation of vegetables.

Objective 2. Establishing the influence of cultivar, of the organic fertilizer dose and mulch variant on early and total tomato production in green houses in a system of sustainable agriculture.

For achieving the first objective the activity, consisted in the collection the data about the natural environment of the studied areas to capture the many agro-pedological aspects that

promote or hinder the development and promotion of organic vegetable growing in S-E of Romania, and implicitly in Brăila country.

The objective was to study the elements of the pedo-climatic conditions, factors and the economic and social factors. Three sheets of research were properly prepared i.e. for research of pedo-climatic factors, of biological factors and for the economic and social factors.

To achieve this major obiectiv following targets have been proposed:

- a. Analysis of landscape conditions in relation to suitability for vegetables.
- b. Analysis of the natural conditions of the localities surveyed.
- c. Study of economic and social conditions of the main places where vegetable growing is practice.

For the second objective, in the frame of every experiences at tomatoes cultivation were used three cultivars that best meet the criteria of climate and soil, the suitability of culture in solariums the production destination, that have resistance and increased tolerance to attack by pathogens, according to principles of sustainable agriculture and demands of consumers.

For tomato cultivation in green houses have been used the following: Francesca F1 Magnus F1 and Belladona F1.

To achieve this major objective, I proposed the following targets:

- a. Study of the influence of cultivar on early and total production of tomato in solariums in sustainable culture system.

- b. Study of the influence of organic fertilization dose on early and total production of tomatoes in green houses in a sustainable culture system.

- c. Study of mulch influence on early and total production of tomatoes in solariums, in a sustainable culture system.

- d. Study of the influence of interaction cultivar x organic fertilization dose on early and total production of tomatoes in green houses in a sustainable culture system.

- e. Study of the influence of the interaction cultivar x version of mulch on early and total production of tomatoes in green houses in a sustainable culture system.

- f. Study of the influence of the interaction organic fertilization dose x version of mulch on early and total tomato production in green houses in a sustainable culture system.

The experimental field is organized at SC Gropeni Starwood Ltd., located on the Danube terrace near the county road DJ 28.

The results will constitute theoretical and practical solutions for professionals in the production of some items that support the possibility of obtaining healthy vegetable products.

The results obtained in this chapter highlight the need of delimitation of convenient areas as regards both the pedo-agrochemical characteristics of soils, and the main climatic conditions of the area, especially in relation to the size of the active growing period.

- Vegetable production in Brăila has grown and will grow only in specialized microzones where there are favorable or very favorable conditions for growing vegetables in terms of soil and climatic conditions;

- Soils that vegetables are grown on belong to several categories and types, but are prevalent chernozems, alluvial soils, etc. which are soils of highest quality: fertile, light, medium and half medium, well structured, with groundwater at over 1,5-2 m depth;

- The location of used land and soils is consistent with the specific requirements of different species; predominantly, the largest areas are planted with cabbage, onions, roots and solanaceous (tomatoes and peppers).

- Climatic conditions are very favorable to thermophilic species - tomatoes, peppers and cucumbers - and favorable to cryophilic species - cabbage, onions, carrots, parsley, etc.

- The vegetable production is carried out uniformly in the forty communes of the county.

- Most areas of vegetables are organized under field conditions. Protected culture, especially in solariums is realised at very high managerial and technical level around the town of Brăila.

- Human potential in the county is very favorable for agriculture and especially vegetable growing: there are good traditions and professional training.

The effect of practicing sustainable agriculture at Brăila country is food security of population. Due to the current state of our agriculture the problem does not arise in terms of surpluses and resort to removing some lands from agricultural use to curb over production. In Romania it comes to using all agricultural lands, their cultivation and maintenance by help of appropriate technologies, such as those of sustainable agriculture.

Following the practice of sustainable agriculture and hence the investments made and state support, there is increasing number of jobs created and maintained in those areas and at the same time, increasing young people in rural areas.

The results obtained in chapter five, the practice shows necessities sustainable tomato crops in Braila county.

- Cultivar Magnus F1 obtained the best results for early production compared to Belladonna and Francesca F, the production increases being of 99.9% (statistically assured). Higher early yields (Magnus F1 - 29.32 t/ha vs. Belladonna F1 - 26.25 t/ha and Francesca F₁ 25.23 t/ha).

- Total production increased from 49.94 t/ha in 2006 (Francesca F₁) to 53.19 t/ha in 2008 (Belladonna F₁).
- The organic fertilizer dose used for tomatoes fertilization affects differently the production growth on both early and total production.
- Early production ranged from 18.46 t/ha (2006) - unfertilized-nonmulched to 37.64 t/ha (2008) by fertilization with 30 t/ha compost in mulch variants. Total production ranged from 36.83 t/ha (2006) - unfertilized-nonmulched to 65.95 t/ha (2008) by fertilization with 30 t/ha compost in mulch variants.
- Mulch variants obtained the best results compared to those nonmulched, regardless of cultivar and fertilizer dose, the provided statistical increase for early and total production being of 99.9%.
- The system of mulch with black foil produces positive changes in the pattern of growth and development of tomato plants, providing nutrients from the biodegradation, helps improving soil structure and creates a better fluid condition in the substrate thus representing a real benefit in terms of agronomy. This system leads to a positive reaction of tomato plants, both in terms of vegetative growth and fructification. Application of mulch film results in an increase of harvest up to 10% for some variants.
- For all three type of tomato fertilisation the correlation of technological data with biological data highlights the positive effect of the use of film mulch, thus reducing stress and limitative effects of summer drought and anthropogenic influence acting on soil quality and plant and vegetable production in an environmentally sound and sustainable development in the SE of Romania.

Analysing the research results, we can affirm that the ecological vegetable production represents the results of interaction of all factors which are necessary in the technological process of obtaining these vegetables and represents especially a reality of agricultural production.