SUMMARY

KEY WORDS: cultivation technology, field crops, plastic tunnels culture, root fertilization, foliar fertilization, mulching.

Culture of sweet pepper is known in Romania and is practiced in almost all areas of the country, although profitability (economic efficiency) is different. The diversity of the environmental conditions, naturally within the temperate continental one, the traditions of cultivation, as well as world scientific achievements at national and international level, motivate the need for the renewal and permanent modernization of cultivation technologies. After the '90s, the Romanian vegetable cultivation is subjected to new challenges due to the downpour of scientific and technical information worldwide, which thus became available. From this broader context, it is sufficient to note the diversity of cultivated varieties and their diversity.

The aim of this PhD thesis was imposed by the challenge and is concretely linked to the possibility of production increase and scheduled by introducing the assortment of sweet peppers grown in our country a new international range of hybrids with high productive potential and fruits of high quality with multiple resistances, which ensure high economic efficiency and incentive benefits to growers.

Achieving this goal was possible by setting concrete goals as follows:

1. Study of natural conditions, technical and organizational framework in which the research was conducted;

2. Study of the behaviour of new sweet pepper cultivars in the global range, in plastic tunnels and in the field;

3. Study of the behaviour of a new variety of sweet pepper grown in different planting densities in plastic tunnels and its influence on production and fruit quality;

4. Study of the influence of combined fertilization, roots and leaves, production and fruit quality of a new assortment of sweet peppers grown in the plastic tunnels;

5. Study of the influence of soil mulching on the production and fruit quality of a new assortment of sweet peppers grown in plastic tunnels.

The investigations were conducted at the University of Agricultural Sciences and Veterinary Medicine Iași and at the Station for Science, Research and Development for vegetables Bacau in 2005-2007.

The proposed targets imposed the use of biological material consisting of five cultivars (four hybrids Albatros F1, Belladonna F1, Gypsy F1, Shy Beauty F1 and variety Ceres) and some biotechnical materials (fertilizers, mulch).

Organizing research was conducted through a series of experiences in the field and plastic tunnels.

The paper is structured in nine chapters over 205 pages. It contains a total of 25 tables and 98 charts, figures and photographs.

The structure of the thesis includes two main parts, the first referring to the current state of research on the topic, and the second one referring to results of personal studies and researches.

Part I - (current state of knowledge on sweet pepper production scheduling) contains two chapters:

Chapter I - General considerations on sweet pepper culture;

Chapter II - Current status of research on the biology, culture, and production scheduling of sweet pepper;

Part II - (The results of studies and researches) comprises seven chapters:

Chapter III - Purpose, objectives, general biological material and research methodology;

Chapter IV - The study of the natural and technical conditions for achieving organizational research;

Chapter V - study of the behaviour of new sweet pepper cultivars from the world array in plastic tunnels and field

Chapter VI - study of the behaviour of a new range of sweet pepper in the plastic tunnels grown in different planting densities and its influence on production and fruit quality;

Chapter VII - study of the influence of combined fertilization, roots and leaves on the production and fruit quality of a new variety of pepper grown in plastic tunnels;

Chapter VIII - Study of the influence of soil mulching agro-textile materials on production and fruit quality of a new assortment of peppers grown in plastic tunnels;

Chapter IX - General conclusions.

Chapter I examines the literature in terms of importance, systematics and sweet pepper cultivation around the world and in our country.

Chapter II presents studies carried out in the country and abroad by specialists, in terms of biology and technology in the sweet pepper culture.

Chapter III summarizes the aim, objectives and general methods for material and research protocol established in the theme of the thesis, aspects mentioned above.

Each major objective focused on material and methodology thus established as to meet the requirements needed to run the proposed experiments and analyses.

In order for the study of the technical and organizational landscape conditions, for the two selected locations, observation, comparative analysis, statistical clustering, data systematization, etc were used as working methods.

The second objective involved conducting observations and biometric measurements on morphology and phenology of the studied sweet pepper assortment.

The last three objectives highlighted as a method of working, the experiment, the data obtained are then processed by suitable statistical and mathematical methods, involving the use of t-test in SPSS in order to assess the significance of the differences.

Chapter IV refers to conditions of natural, technical and organizational framework existing in the two selected locations by research theme (Iași and Bacău).

Overall hydrological conditions, soil and climatic indicate as favourable the two selected locations for growing sweet peppers. Thus, in Iaşi, the annual average air temperature is 9.6 ° C, with a multiannual rain regime of about 517.8 mm. Bacău county has a specific thermal regime for the temperate continental climate regime, with an annual average of about 9 oC and an amount of average annual rainfall of about 541.8 mm.

The soil is in both cases a medium chernozem –in Bacau being alluvial - well-stocked in nutrients, with a favourable structure and texture for vegetables cultivation and therefore sweet peppers culture.

Weather conditions were favourable during the experimental period for sweet pepper culture for both research perimeters defined by this doctoral thesis. Also the systematic data collected for both Iași and Bacău showed that, through, territorial issues, administrative and logistic can conduct in good conditions the research activities under the protocol agreed.

Chapter V aimed at studying the behaviour of new hybrids of sweet pepper in different culture systems, in two blocks defined in the counties of Iași and Bacău. To achieve this purpose, the following specific objectives were considered: assessing the production capacity of the studied cultivars and determining their biometric indices of the fruit in different culture systems, biochemical characterization of the fruit of the pepper cultivars taken in the study, appreciation of the production capacity of the cultivars studied, determination of biometric indices of the fruit and their biochemical characterization field for two different locations Iași and Bacău.

The comparative culture system showed the influence of cultural system on the production capacity and studied biometric indicators, the highest values occurring in culture

conditions in the plastic tunnels, aspect registered at each of the selected cultivars. An opposite point was determined for biochemical parameters, the results obtained from the plants grown in the field being better than those grown in the plastic tunnels.

After statistical processing, the hybrid Belladonna F1 was highlighted in both culture locations, the maximum values being recorded for three of the analysed indicators: pulp thickness (Iași - 5.75 mm, Bacău - 6.02 mm), average fruit weight (Iași - 140.22 g, Bacău - 62.77 g) and total production (Iași - 41.30 t / ha, Bacău -44.54 t / ha).

Chapter VI studies the influence of the technological factor density on the production capacity from five cultivars of sweet pepper as well as the biochemical characterization of fruit, under the same conditions.

No matter of the density applied, the Belladonna F1 cultivar was considered superior, in terms of productivity, to all the other cultivars studied, as confirmed by highest values corresponding to both total production and for two biometric indicators (fruit diameter and average fruit weight).

Influence of the B factor (density) has designated as the best alternative density 47419 plants / ha, determining thus statistically significant differences compared to the average, for cultivars Gypsy F1 and Shy Beauty F1, aspect relevant for both types of production (early and total). The same density showed remarkable results for Belladonna F1 cultivar as well, the differences to its own average being, in this case, significant for both early production and for the total.

Chapter VII refers to the results of research on the influence of different types of fertilization on productivity and determination of biometric and biochemical indicators of fruit belonging to the range of new hybrids studied.

Fertilization variant with Kristalon verde+ $N_{80}P_{80}K_{80}$ had the highest results concerning the total production and average fruit weight, regardless of cultivar, while the other three analyzed indicators (fruit length, fruit diameter and flesh thickness) maximum values were recorded both when Kristalon verde+ $N_{80}P_{80}K_{80}$ (V8) was applied as well as fertilization with Fertcomplex + $N_{80}P_{80}K_{80}$ (V7) was used, results marked by the variation of the cultivar factor.

Belladonna F1 hybrid was distinguished by its genetic potential, aspect registered in the highest values obtained for three of the studied parameters (total production, fruit diameter and average weight of fruit) at each of the graduations in B factor, while Shy Beauty F1 cultivar had the highest values in the assortment regarding the vitamin C content, regardless of the variant of fertilization.

Vitamin C content and titratable acidity indicated V8 variant (Kristalon verde+ $N_{80}P_{80}K_{80}$) as the best option for the biochemical indicators, as evidenced in each cultivar, the control (unfertilized) being exceeded by 64%, respectively 61% .

The content of soluble carbohydrates and the ratio between soluble carbohydrates and acidity showed good results for both V8 variant (Kristalon verde + $N_{80}P_{80}K_{80}$) and for V9 (Biostar + $N_{80}P_{80}K_{80}$), the cultivar factor influencing in this respect the results.

Chapter VIII presents the study of the influence of different types of soil mulching on production and fruit quality of a new assortment of sweet peppers.

Examining, by comparison, different types of used mulch, it was found that the best results were obtained for culture mulching with black foil (V3) for four parameters (the total production, length of the fruit, pulp thickness and average weight of fruit), regardless of cultivar variation factor.

Belladonna F1 hybrid ranked as first in the assortment studied, with the highest values recorded in three of the five analyzed indicators such as the total production (V1 - 42.56 t / ha, V2 - 47.17 t / ha, V3 - 53.0 t / ha), fruit diameter (V1 - 8.38 cm, V2 - 8.80 cm, V3 - 8.96 cm) and average weight of fruit (V1 - 134.4 g, V2 - 151, 4 g, V3 - 163.4 g).

The last chapter of the thesis describes the general conclusions and recommendations, representing a synthesis of research, measurements and tests being carried out and also a certainty that the protocol objectives of this thesis were fulfilled.

The thesis presents a number of 43 conclusions.