ABSTRACT

Key words: rhubarb, variety of rhubarb, creation stage, crop density, germination of seeds, transplants.

Cultivation of rhubarb (*Rheum rhabarbarum* L.) is little known, spread and used, not being one of the traditional vegetable species. It was brought in Europe in the XVI-XVII-th centuries. And around that time it was introduced in Romania, being cultivated and used by the people with German root, in the south-east of Transylvania and it was also used in the north-west of Moldavia.

Its cultivation is rooted in China and Central Asia and it is known for more than four-five thousand years, being considered a very valuable medicinal plant from whose roots helpful preparations can be prepared, their value being known world-wide.

In Europe, it is famous especially for its vegetable-like qualities, it is used in desserts, from which we use the petiole so as to make compots, jams and other similar dishes.

The cultivation of this plant is pretty wide-spread especially in the west of Europe, in cool and moist areas, where it can actually find excellent conditions to grow and develop. It is equally famous in the USA and Canada.

This plant is cultivated on relatively small areas, no more than 1-2 hectares, in family gardens, such as the so-called hobby garden or even vegetable micro forms.

Through studying the bibliography and through field work, we can state the fact that rhubarb is a perennial grassy plant that can multiply through seeds or root cuttings. Its cultivation can be turned into products after 2-3 years, being envisaged as a vigorous plant, in the shape of a rosette of big leaves, having a few flower stalks of about 1,5 meters high in the middle.

Plants have a high rusticity and are well adapted to the temperate continental climate, even if they grow and develop better in a cool and moist climate(like the oceanic one), as the one you can find in the north-west of Europe or in Great Britain.

The present conditions, caused by globalization and even by the fact people travel a lot, increased the interest of Romanians as far as it concerns this plant, especially since the pedoclimatic conditions are mainly in favour of this cultivation of rhubarb.

Since we know this information, it is only evident that our scientific paper and vegetable production are based on the cultivation of this plant. As a result, our goal is to get thoroughly into the knowledge of rhubarb cultivation, so as to assess the possibilities of introducing and generalizing this plant with the conditions our country has to offer.

As a first step of this procedure, our purpose, which is, in fact, the topic of our Ph. Degree Paper, is to evaluate the ways of improving technology that helps the cultivation of rhubarb, under our country's climate conditions, with special focus on north-eastern Romania.

The Philosophy Degree Paper is made-up of two parts and six chapters.

Part I – The current state of the scientific knowledge base regarding the rhubarb crop (*Rheum rhabarbarum* L.)

Chapter 1 – Knowledge regarding the rhubarb species and the importance of its cultivation

Chapter 2 – Knowledge regarding the main technological factors and their importance in rhubarb cultivation

Part II – Research results

Chapter 3 – Research purpose and objectives. The biological material used and the general methodology

Chapter 4 – The study of the natural and meteorological conditions in which the research was carried out

Chapter 5 – The study of some technological factors in preparing the biological material used in establishing the crop

Chapter 6 – The study of the influence of some technological factors in the crop-establishment period (1st – 2nd year)

Chapter 7 – General conclusions

Bibliography.

The bibliography contains a number of 119 references, both from Romania and abroad.

The first part of the Philosophy Degree Paper is made up of two chapters and contains general information from specialised literature about the present level of knowledge on rhubarb cultivation.

The first chapter contains four subchapters on: The Origin of Rhubarb and area of growth, Biological and Ecological Features, The biosystematics of Genus and Species, Varieties of Rhubarb Used, The Importance of Rhubarb Cultivation.

The second chapter is made up of two subchapters: Definition and Content of Technology Factors, The Features of Some Technology Factors in the Development of Rhubarb Cultivation.

The second part of the Paper, as it was presented before comprises seven chapters and it is my personal contribution based on studies undergone between 2012-2015.

The third chapter illustrates the purpose, the objectives, the biological material used and the methodology concepts.

The purpose of these studies is to support anyone with valuable technical information on rhubarb cultivation in our country's conditions and to assess the technical possibilities for this promotion.

So as to accomplish this purpose, the following objectives have been established:

1. *Deciding upon the technology for obtaining and using the biological material necessary for the creation and growth of rhubarb*

2. *Establishing how much technological factors, varieties of rhubarb used, the moment of creation and the distance of creation (the density of cultivation) influence the success of cultivation, in years I-II from creation*

3. *Establishing the best combinations of factors, varieties of rhubarb density so as to obtain the most performant production in years I and II from appearance*

4. *Validation of the best technological options based on varieties of rhubarb used, stage, density, in the second year of cultivation, perceived as a standard for the evaluation of production.*

The general methods of studying and the biological material are detailed in a subchapter from Chapter 3 and also in Chapters 5 and 6.

As biological material, seeds, transplants and root cuttings from 3 varieties of rhubarb: Victoria, Glaskin's perpetual and Local Varieties.

The studying methodology refers to _ of seeds, production of transplants and the creation of root cuttings from root and then it refers to other factors of creating the plant, the year, the varieties of rhubarb, the stage and the density of creation.

Chapter 4: illustrates the studying of natural conditions, underlining a few aspects, such as: the definition, the content and the importance of natural conditions, geographical setting, forms of relief, hydrology, soil and climate conditions (temperature, rainfalls, humidity) and meteorological conditions from the experimental stage.

Chapter 5: represents the studying of technological factors in the preparation of the biological material used for the creation of plants, it is structured in 3 subchapters: purpose and objectives, material and methods, the results we obtained and partial conclusions. The results refer to: germination of seeds, appearance of plants, quality of transplants and obtaining of rhubarb root cutting.

In synthesis, rhubarb seeds germinate relatively fast in about 5-6 days, at a temperature of 20-22 °C. The best quality transplants can be obtained on a substrate of composted peat, connected to a specially designed network created by the producer. The transplant is suitable for planting it at around 50 days of age.

Root cuttings were obtained in two ways: one-bud root cuttings, rooted in pots(flower pots) for winter time and multiple-bud root cuttings, obtained through the removing of bushes and planted immediately after removing them from the mother-plant. From such a mother-plant, in the V-th year, you can obtain 10-15 root-cuttings, one-bud root-cuttings connected to the root and 4-5 pieces of multiple-bud root-cuttings.

The advantages and disadvantages of each type of biological material are illustrated. Biologically, the best material is made-up of one-bud root-cuttings, connected to a root, and the cheapest material is the root-cutting obtained in especially designed places for this.

Chapter 6: it is the most extensive one and it illustrates research on the influence of some technological factors in the stage of the appearance on the plant(in years I-II)

This chapter also comprises some components: the purpose and the objectives of research, the material and ways of studying, the results that were obtained and conclusions.

The purpose of the research we presented in this chapter is that of establishing in what way the cultivation of rhubarb is influenced in years I and II; the technological factors of rhubarb varieties the stage of appearance and density. The varieties of rhubarb are: Victoria, Glaskin's Perpetual and Local Varieties. The other factor, stage of appearance contains two moments: 20.04 and 5.05, while the density factor includes two variants: 13.330 plants/hectare(1,00 x 0,75 m) and 10.000 plants/hectare (1,00 x 1,00 m).

The result are structured for the I and II year. In the first year, the development of culture is assessed together with the possibility of picking up petioles for consumption. Analytically, the influence of each of the three experimental factors is analysed, and also the influence of combination of factors: varieties of rhubarb x stage; varieties of rhubarb x density; stage x density and varieties of rhubarb x stage x density.

In the first year, all of the factors have an evident influence, illustrated individually and also at combination level. The evaluation of combinations studied was established through the dynamics of growth and development, variety of plants and the influence upon the amount of production. From this point of view, Victoria was an essentially important factor from the varieties of rhubarb, as a stage – the first one (20.04) and as density: 13.330 plants per hectare.

From the combination of factors, the most suitable ones turned out to be: Victoria x stage I; Victoria x density 13.330 plants per hectare; stage I x density 13.330 plants/hectare and, finally Victoria x stage I x density 13.330 plants/hectare.

During the second year, the same factors were studied, but in the stage of consolidating the plants, but, generally, the level of production reaches levels close to ordinary production. So, the studying of the influence of experimental factors represents, somehow, validation activity of the importance of experimental factors.

From the experimental data, we have the proof that average production, at experimental level, was 34:28 tons/hectare. Related to this average, the experimental factors had specific values.

From the experimental result obtained in the II-nd year of cultivation, the best variety of rhubarb was Victoria, with a production of 40,07 tons/hectare.

The stage of creation in the two options (20.04 and 5.05) no stronger exerts a powerful influence, so, that the production differences between the two options are relatively cancelled and have no importance as far as experience average is concerned.

The density of plants caused important differences, the best one being 13,300 plants per hectare, 0,75 x 1,00m. We find it interesting to have discovered that density 13.330 plants/hectare is more beneficial (assuring bigger productions) than the 10.000 plants/hectare density. This information is validated by specialized literature, which recommend bigger spaces between plants.

The combination of factors show that success can be achieved through Victoria variety of rhubarb and the density of 13.330 plants/hectare. It is important that this combination increase the production potential of experimental factors: for example, the combination Victoria x 20.04 x 13.330 can guarantee a production of 46,82 tons/h.

In conclusion, the purpose and the objectives of the Philosophy Degree Paper were fully achieved.