

ABSTRACT

Keywords: castor, epoch of sowing, genotype, distance between row.

Undisputed evidence proves that castor oil was cultivated 5,000 to 6,000 years ago in the warm, temperate regions of Egypt, Iraq, India etc., Herodotus (484-425 BC), a Greek historian, recalls castor in his writings calling him *chichi*. Because its seeds are very similar to ticks, the Romanians called it ricinus (tick), a name that has been preserved today and under which the genus is now known by all botanists in the world.

In Romania, this species is cultivated quite a bit, however, due to the non-observance of the cultivation technology and the most favorable areas for cultivation, mainly the seed production registers quite large oscillations. However, the increase in castor production in our country raises a number of problems caused by a multitude of aspects.

First of all, it should be noted that castor, from a pear shrub in the area of origin, became an annual plant, with continuous growth and branching, until the appearance of frosts in autumn. The cultivation area of this plant in Romania is at northern limit of cultivation in the world.

The plant has a number of biological features that cause difficulties in cultivation technology. In addition, there are certain elements in the biology and technology of cultivation of this plant that are too little known or even totally unknown yet. The culture is sometimes too dispersed, which leads to difficulties in organizing the production process.

Castor belongs to the family *Euphorbiaceae* species *Ricinus communis* L., included in the subfamily *Acalyphoideae* which includes 99 genera and 1865 species.

The doctoral thesis entitled "**Research regarding the improving castor (*Ricinus communis* L.) cultivation technology in view of cultivation in the central area of Moldova**" includes 9 chapters in 186 pages, 50 tables and 35 figures.

It has two distinct parts, the **first part** summarizing the data on "The current state of research on the species *Ricinus communis* L." and comprises three chapters. In these chapters are presented information from the national and international literature with reference to the subject of the doctoral thesis and which were used later in the second part of the thesis to compare and interpret the experimental results obtained.

In **Part II** entitled "Presentation and interpretation of the experimental results. Conclusions and recommendations" are six chapters. Here we presented the natural environment in which we performed the researches, research material and method and the results of their own experimental research.

The location of the experiments was carried out at the Society Agricultural Moldoveni, established in 1991, cultivating approximately 800 hectares in the

communes of Secuieni and Moldoveni in Neamț County. The territory belongs geographically to the Central Moldavian Plateau.

The main purpose of the doctoral thesis is to improve the technology of castor cultivation in the pedoclimatic conditions in the Center of Moldova.

In our research we set the following objectives: establishing genotypes with the highest adaptability to soil and climatic conditions in the area, establishing the optimal epoch of sowing on seed production and quality, establishing the influence of nutrition space on seed production and quality, establishing the influence of ecological factors in years of experimentation on castor production and the extension of research results in zonal agriculture.

In order to clarify the aspects proposed in the doctoral thesis, in the period 2018 - 2020, a multifactorial experiment with technological sequences was placed on different castor genotypes in the pedoclimatic conditions in the area.

The experiment was of the 4x4x3 type and aimed to identify the genotype with the highest adaptability to climatic conditions in the area of influence and establish the optimal sowing time and the optimal nutrition space. Factor A was represented by genotype, namely: a_1 - Dragon, a_2 - Rivlas, a_3 - Cristian and a_4 - Teleorman, factor B of the epoch of sowing: b_1 - sown in the first decade of April; b_2 - sown in the second decade of April, b_3 - sown in the third decade of April and b_4 - sown in the first decade of May, and the factor C distance between rows: c_1 - 50 cm between rows, c_2 - 70 cm between rows and c_3 - 100 cm between rows.

The results obtained showed that castor oil preferred germination temperatures of 14 °C to achieve 83.6% germinated seeds in 8 days. At a temperature of 18°C the castor germinated in 5 days, obtaining a uniform germination and with a very small percentage of ungerminated seeds.

The average of the three years indicates that the earliest variety in our country, Teleorman, has the greatest adaptability to the conditions of the area.

The second epoch of sowing was positively influenced the seed production, and its level was influenced by the climatic conditions recorded in the analyzed period. During the study period (2018 - 2020), the highest production increases (38 kg/ha, respectively 127 kg/ha), compared to the control were obtained for the varieties sown in the first and second epochs, as a result, castor is favorable for sowing until the second half of April.

The density should be set to greatly reduce the production of secondary racemes, which do not always reach maturity. The results obtained on average over the three years of experimentation show us that the highest production was obtained for the variant sown at 70 cm between rows (1423 kg / ha), which shows that castor responds favorably at this distance.

Among the factors that led to the superiority of the variant sown at 70 cm between rows in the study period, we must mention the following: the possibility of

mechanical tillage until advanced stages of vegetation without affecting the roots and foliar apparatus, on the lower stages of the leaves, earlier harvesting of the capsules and their uniform maturation.

The average productions obtained were directly influenced by the experienced technological factors. These ranged from 977 kg/ha (Rivlas x 4th epoch x 100 cm between rows) to 1607 kg/ha (Teleorman x 2nd epoch x 70 cm between rows).

On average over the three years studied, the values of the mass of one thousand grains varied between the limits of 225.9 g (Teleorman x 4th epoch x 50 cm) and up to 327.0 g (Rivlas x 2nd epoch x 70 cm). Compared to the control variant, the Rivlas and Cristian varieties obtained the most significant increases in the different interactions studied.

During the analyzed period, the obtained results highlighted the fact that the value of the hectolitre mass was influenced by the studied factors. Thus, the values were between 51.8 kg/hl (Teleorman x 4th epoch x 50 cm) and 59.4 kg/hl (Rivlas x 2nd epoch x 70 cm).

The interaction of the studied factors influenced the production of castor oil. Thus, oil production varied from 519 kg/ha (Rivlas x 4th epoch x 100 cm) to 853 kg/ha (Christian x 2nd epoch x 70 cm).

Protein production was influenced by the sowing period, its values were between 116 kg/ha (Rivlas x 4th epoch x 100 cm) and 221 kg/ha (Christian x 2nd epoch x 70 cm).

The studied technological factors had positive and negative influences on the chemical composition of castor seeds. Thus, the production of ricinoleic acid varied from 461.66 kg/ha (Rivlas x 4th epoch x 100 cm) to 767.05 kg/ha (Teleorman x 2nd epoch x 70 cm).

Regarding the production of palmitic acid, it varied from 3.23 kg/ha (Dragon x 4th epoch x 100 cm) to 9.94 kg/ha (Teleorman x 2nd epoch x 70 cm).

The results obtained in the period 2018-2020 have highlighted the fact that castor oil can be a crop that can bring enough net profit, only if the appropriate cultivation technology is applied. The lowest average production cost (1,736 lei/ha) was obtained at the interaction between the Teleorman variety x 2nd epoch x 70 cm, and the most expensive variant (2,926 lei/ha) was the one corresponding to the interaction between the Dragon x 4th epoch x 100 cm.

The average net profit achieved during the analyzed period varied widely from 7016 lei/ha (Dragon x 4th epoch x 100 cm) to 12046 lei/ha (Teleorman x 2nd epoch x 70 cm).