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RESEARCH IN THE FIELD OF CULTIVATION OF THE PLANT SYLIBUM MARIANUM L. IN THE CONDITIONS OF KARAKALPAKSTAN

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Summary:
The article presents the results of research on the cultivation of Sylibum marianum L. in the conditions of Karakalpakstan. The biometric indicators (growth, development and productivity) of the milk thistle plant have been comparatively studied. Compared to the control, these indicators were higher in the area treated with mineral fertilizers, and in the area sown with organic fertilizers, the indicators were even higher.

Keywords: milk thistle, Sylibum marianum L., fruits, cultivation technology, organic and mineral fertilizers, phenological observations, yield.

From the pharmaceutical point of view, the medicinal raw material of Sylibum marianum L. , a member of the Asteraceae family, is its fruits (Sylibum mariani fructus) collected during full ripening . According to the Pharmacopoeia article (1), the raw material should contains flavolignans (not less than 2.4% calculated as silybin), vegetable oils (not less than 15%) and extractives (not less than 4% in 80% alcohol).

A collection of flavolignans contained in fruits - Silymarin helps to regenerate liver cells, protects them from the effects of toxins, alcohol, drugs and infections. Silymarin also improves the antioxidant protection of cells by binding free radicals and suppressing lipid peroxidation. Milk thistle help reduce cholesterol and triglycerides in the blood, which prevents atherosclerosis, cardiovascular disease and other cardiovascular diseases. All of the above properties of milk thistle make it a valuable plant for use in folk and official medicine. Due to its wide range of effects

and relatively few side effects, it is an effective and safe remedy for the health of the liver and the whole body (2,3).

When studying the natural reserves of Silybum marianum (L.) Gaertn., it was found that the area covered by ruderal vegetation in Jizzakh, Kashkadarya, Surkhandarya regions in 10 plant communities is 62.1 hectares, the biological reserve is 54.6 tons, and the annual production amount is 27.3 tons (4). However, in Silybum marianum , the highest amount of silymarin (1.40-1.84%) is in the seeds of Shahrisabz and Boysun-Denov populations, and the lowest amount is in the above-ground part of Shahrisabz, Hisar populations (0.63-0.64%) . This means that the product does not meet the requirements of FS.2.5.0035.15 . In the conditions of cultivation, this indicator is 1.50% in the herbal parts of the plant, 3.10% in the seeds , that is, the fruits meet the requirements of FS.2.5.0035.15. Taking into account the fact that in the scale for assessing the success of cultivation consist of milk thistle is 11 points on a 13-point scale, it means that it is appropriate to grow it in culture.

The research conducted in Khorezm region, the Debut variety was superior in terms of the ability to retain water in the leaves of rastaropsha varieties during the development phases (in the stages of the formation of branches, shoot, flowering and ripening) (53.2%, 50.4%, 51.0% and 24.3%). The lowest rate of water retention capacity was observed in the Samarianka variety and was found to be 36.2%, 30.0%, 26.7% and 21.7%, respectively (5). Therefore, environmental conditions arising from its bioecological characteristics, planting norms and periods for a certain growing area, cultivation technology, methods of collecting, drying and storing medicinal raw materials are important for the productivity and quality of raw materials of the plant.

However, this information in the literature does not allow us to recommend large-scale cultivation of this promising medicinal plant - Silibum marianum L. in the conditions of Karakalpakstan. Taking to account the differences between the ecological, physiological, fertilization and growth energy of seeds in the juvenile period, seasonal growth and development during ontogenesis, and chemical properties of seeds and other specific biological characteristics of S. marianum L. in the conditions of Karakalpakstan, researching its composition is of actual scientific and practical importance. Considering that there are no recommendations on the cultivation technology of S. marianum L. in the conditions of the Karakalpakstan region , the purpose of our research is to determine the optimal planting methods, planting norms and periods, methods of soil treatment by the organical and mineral fertilizers before planting.

The subject of the study was cultivation of Silybum marianum L. plant in the conditions of Karakalpakstan , its growth, development and productivity, as well as the chemical composition of seeds.

Research methods: Field experiments were conducted in 2022-2023 at the experimental site "Nukus District Forestry" located in Nukus District. Organization and conduct of field experiments, phenological observation methods and statistical analysis in experimental areas were condacted by the methods of Dospekhov V.A. (1985). In the spring, fertilizers were applied in small doses, organic fertilizers (4 kg of manure per 1 m^2) and mineral fertilizers (0.5 kg per 1 m^2: 2:3 phosphorus, nitrogen). The seeds were sown in three different variants with 30 cm row spacing, without fertilizer, on the land treated with organic and mineral fertilizers.

Scientific novelty of the work. Considering the regional agro-ecological and production resources, the biological properties of S.marianum L. were studied for the first time depending on the main cultivation methods, the effect of mineral and organic fertilizers on the productivity of S.marianum L. was theoretically based and experimentally confirmed.

Results of the study. Biometric indicators (growth, development and productivity) of the milk thistle plant were defenited on comparitive. The height of the plant was on average 45-50 cm in the field planted without fertilizer, 145-150 cm in the field planted with mineral fertilizers, 155-165 cm with organic fertilizer. In the first option, the average number of leaves on a plant is 10-12 pieces, in the second option 15-16 pieces , in the third option 16-18 pieces.

Since the main medicinal raw material of milk thistle is the seeds, the number of the baskets and quantity the seeds formed in them largely depend on the productivity of the plants. The individual productivity of plants is influenced by the indicator - the number of seeds obtained from one plant. On average, 4-5 baskets were formed in plants planted in a row without fertilizer, and each basket ripened on average, on average 22.1 seeds per each. In plants planted with mineral and organic fertilizers were formed 5-6 baskets and in the basket seeds the number is 45-54 pieces.

So so, you will be milk thistle fruits were completed in 85-110 days. The highest number of seeds (225-324 pieces) was recorded when fed with organic and mineral fertilizers, and the least number of seeds (88-110) were observed when milk thistle fruits grown without fertilizers.

1000 pcs seed mass an average of 24.5-25.0 grams organize did.

Conclusions: Productivity of S. marianum L. depends on the type of fertilizers used, row spacing, harvesting methods and of the year the weather to the conditions dependency will be S. marianum L. plant of their seeds the most high yield organic fertilizer with when trained. With a planted option provided row 30 cm between , in research years according to average is 1.68 t/ ha did , this is more 0.58 t/ha from the control.

Very important fact is S. marianum L. with unwanted plants of plants competitiveness. With a row spacing of 30 cm, the spreading leaves of S. marianum L. close the rows and prevent weed growth.

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