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PERSPECTIVES OF CREATING CALENDULA OFFICINALIS L. PLANTATIONS IN SALINE SOILS OF KHOREZM REGION

Abstract: According to the results of a study on medicinal marigold (*Calendula officinalis* L.) in order to create plantations of large areas of medicinal plants in different saline soils of Khorezm region, its yield constitutes 12780 kg in wet conditions and 1597,5 kg in dry conditions and this medicinal plant has the ability to produce the desired yield even in the conditions of saline sandy soils.

Key words: Salted, Khorezm region, soil, medicinal marigold, basket, yield, plantation.

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Introduction

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The reserves of raw materials of medicinal plants growing naturally are also limited, and one of the urgent problems is the development of scientifically based methods for their protection, study of bioecological properties, the correct use and reproduction of raw materials reserves. Therefore, in Uzbekistan it is necessary to provide the needs of the pharmaceutical industry with raw materials of medicinal plants, enrich the local flora with new

introducessive plant species and develop agrotechnologies for their cultivation, and organize maternity plantations[1].

In subsequent years, there is a rapid development of the pharmaceutical industry in most countries, including the Republic of Uzbekistan. For this reason, the demand of pharmaceutical enterprises for the raw materials of medicinal plants is also sharply increasing [2].

Paragraph 9.1 of the decree of the president of the Republic of Uzbekistan dated February 14, 2018 No. 3532 "on additional measures for the rapid

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development of the pharmaceutical network" dated April 10, 2020 PP-4670 "on the establishment of plantations of medicinal plants" and "measures to expand the scope of scientific research on the protection, cultural cultivation, processing and rational use of scientific research work in this direction is of particular importance in the implementation of the tasks set by the decisions of PP-4901 dated November 26, 2020 [3,4,5] and other regulatory legal acts related to this activity.

A lot of scientific and practical work has been carried out in the field of development of domestic medicinal plant science in our republic, and the demand of the drug production network for plant raw materials is being met to the extent possible.

But due to the development of drug production networks, their demand for raw materials of medicinal plants also increases. This is why the raw materials currently grown cannot fully satisfy the demand of the pharmaceutical industry for raw materials.

As a result, this problem imposes additional requirements on raw material growers:

- establishment of new plantations by breeding their seeds for raw cultivation using natural reserves of medicinal plants ;
- imposes such requirements as increasing the quality and quantity of raw materials by introducing new plants.

These requirements are carried out with the help of conducting research in the following areas.

1. Rational use of medicinal plants belonging to the flora of Uzbekistan, reproduction and cultivation of species with decreasing reserves.

2. The introduction of medicinal plants belonging to foreign flora into local conditions, the study of their bio-ecological characteristics and the development of cultivation methods, the establishment of plantations [6].

The selection of plants resistant to salinity based on the results of the introduction of medicinal plants into local conditions, as well as the cultivation of raw materials of medicinal plants in a saline lands and the organization of industrial plantations.

Object and Methods of Research.

Medicinal fingernails as a research object (*Calendula officinalis* L.) the type was used. The main task of the study is to make this medicinal plant a reserve of raw materials, forming industrial plantations on saline and sandy soils of the Khorezm Oasis.

Therefore, one of the main tasks on the agenda is the cultivation of medicinal plants in various agrophytocenoses, the cultivation of raw materials and the organization of plantations in large areas.

Based on the results of the studies, the saline soil of the Khorezm region is a medicinal plant selected separately in climatic conditions *C. officinalis* L. the basis for the creation of a raw material base of the

pharmaceutical industry will be developed with the establishment of crop production (plantation) in large areas.

Despite the fact that this medicinal plant was studied in other regions of the Republic, in the conditions of Sandy saline soils of the Khorezm region, *C. officinalis* L. there is very little data on the growth, development and yield of. The research was carried out in the Khiva District of Khorezm region in a small area, the experimental experimental base of Khorezm Mamun Academy and the experimental field "Karakum" in a large area in soil-climatic conditions.

Scientific experiments were carried out on an area of 1.5 ha, prepared in the autumn(October)season of 2020, in the early spring of 2021 (the first December of March), at a planting depth of 2-3 cm, the experimental base of the Khorezm Mamun Academy was planted.

Plantation during scientific experiments in practical work *C. officinalis* L. for the sowing period in the spring season, a pink-shaped row (60 cm) was chosen as the most optimal option according to the planting procedure in the field, and optimal agrotechnical measures were used. Practical work on the plantation scale was carried out in the fields of the Karakum scientific Experimental Station of the scientific research institute of Forestry in the Khiva district.

In Uzbekistan, too, Murdakhaev (1991), Tokhtaev (2009)carried out a lot of scientific research on the cultivation and organization of plantations of this plant. On the basis of their work, large-scale plantations were established on the fertile and saline soils of our republic [1.4].

Observations through scientific template methods in the study of seasonal stages of development, *C. officinalis* L. the main development phases of the plant were carried out between the start and end periods. Statistical analysis of the results of phenological observation V.N.Carried out on the recommendations of Nilov [3]. Mutual correlations of the information obtained were also determined [4].

Results obtained and their analysis.

An important role in the cultivation and cultivation of each type of plant is played by agrotechnical measures. That is, as a result of the application of agrotechnical measures, it leads to a change in crop yields in quantity and quality, as well as an improvement.

The corkscrew arrow is rooted, it reaches 40 cm, they are 5-25 CM of the soil. It is well networked in a lying way on the floor. He likes fertile soil. The land on which the drive is given a rest, as well as the land is convenient for *Calendula officinalis* cultivation. In order for the plant to bloom for a long time and well, during the autumn plowing, 30-40 tons of manure or 20 tons of manure were mixed with 60 kg of

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phosphorus fertilizers per hectare of land. We also followed these guidelines when organizing plantations of the plant[1]

The selected area was sprayed with the help of hand-held seeders with medicinal *Calendula officinalis*

seeds into the pink of the rows 60 cm between the rows.

To the agrotechnical measures developed in the studies *C. officinalis* L. it was observed in the organization of large-scale arable land (plantation).

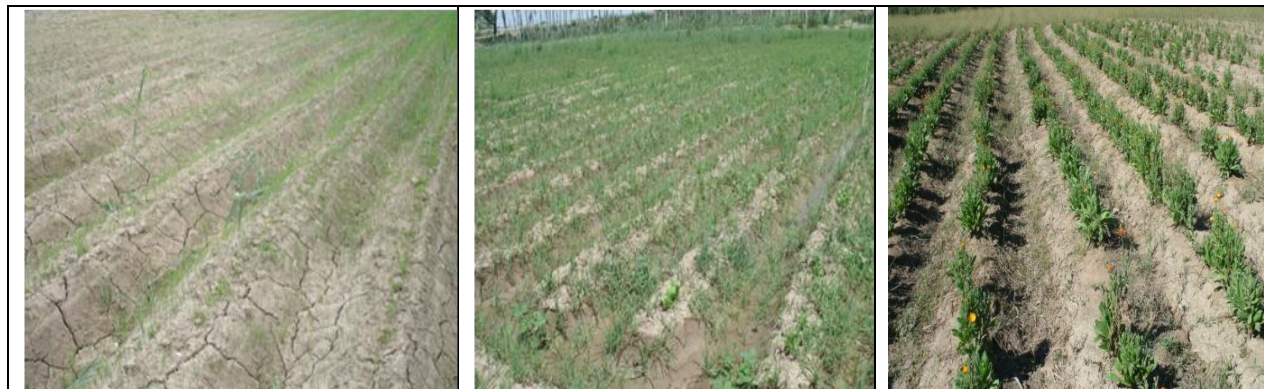


Figure 1. Manifestations of seed germination of medicinal fingernails, irrigation, first-time weeding of the plantation and the beginning of the generative process.

At the time of the first crossing, the only one was also made, leaving 1-2 plants in each hive at a distance of 15-20 cm between the Cathars. The weeds in the row were cleaned with the help of hoe, and the seedlings were loosened in the tag, and between the rows they were loosened in a tractor cultivator.

During the season, the corkscrew crop was watered 13 times (in May-1, June-July-August-2-3 Times, September-2 times). After every 2-3 watering,

the Earth is loosened until the hornbeam is adjacent to each other, the rows are cleaned of foreign vegetation.

With the plant developing well and expanding or branching of the main stem and side stems, juice was given to natural manure twice during watering to ensure that its inflorescences are dense, as well as to obtain a high yield. 10-12 tons per hectare: the first fertilization-15-20 days after formation.



Figure 2. The process of flowering and picking flowers to the yoppasi on the plantation of the medicinal *Calendula officinalis*

On the plantation of plants, the stage of flowering of the plant initially into the clod is observed in 45-50 days after germination. This time falls on the 2 nchi decads of April.

During the growing season (mid-November), the medicinal *Calendula officinalis* blooms and dials up to 9-10 times. The flower baskets of the medicinal *Calendula officinalis* are initially quite large and dark red color. With an increase in air temperature, the

color of the flower turns pale, the reason is that the essential oils of the flower fly quickly with an increase in temperature.

During the period of observations, it was found that each Bush of medicinal *Calendula officinalis* contains 3-5 flowers and 7-8 heifers.

To determine the yield, 5 pitches were allocated on the plantation, or calculations were carried out on the basis of 5 returns generally speaking, the

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plantation has an average yield of 12,780 kg in wet form, 1,597.5 kg in dry form, on account of hectares (Table 1).

Table-1. Yield indicators on the plantation of medicinal Calendula officinalis

Allocated fields	Weight of plucked flowers during growing season, 1m ² / gr		Yield per 1 hectare account, kg	
	At Wet condition	At Dry condition	Wet conditionkg	Dry conditionkg
1	130	16,25	11700	1462,5
2	170	21,25	15300	1912,5
3	120	15,00	10800	1350,0
4	140	17,50	12600	1575,0
5	150	18,75	13500	1687,5
Mediocre			12780	1597,5

To quickly dry the harvested flower baskets of medicinal Calendula officinalis, it is necessary to dry in a special hanger, where a good wind will circulate. Flowers under a temperature of 24-25 °C, the drying process within 3-4 days to 13% humidity in the shade exposition will be in moderation. In special hangers, 1.5 -2.0 kg per square meter.

Raw materials that have reached a dry state are placed in New bags and labeled in the bag with the name of the raw material, the place where the plant was grown, the time it was picked and the place where

the raw materials were dried, as well as the day it was covered, stored in a separate dry place.

In a specially allocated area, the seeds of the Calendula officinalis were collected in baskets during the full ripening period. During the experiments, a separate area was allocated for fertilization, and in this area flower baskets were collected, and the collected raw materials were spread out in a separate place for fertilization. The fertility was 240-250 kg at the expense of hectares.



Figure 3. Determination of yield, dried flowers and seeds on the medicinal Calendula officinalis

In Summary.

The following conclusions can be drawn from the scientific research work carried out: sowing deadlines and methods C. officinalis L. on the plantation of the plant affects the yield indicators;

Separately, it should be noted that for the first time, according to the results of our scientific

research, C. officinalis L. ni as a medicinal plant was justified by scientific results of planting in moderately saline soils of the Khorezm region, cultivation and the organization of plantations on large areas, as well as the possibility of providing the pharmaceutical production network with local raw materials.

References:

1. Tokhtaev, B.Y., Inkamav, T.X., Payganov, A.A., Mamatkarimov, A.I., Mahmudov, A.V., & Alleyarov, M.A'. (2015). *Instructions for the*

organization and preparation of raw materials of plantations of medicinal and fodder plants. (p.3). Tashkent.

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2. Akhmedov, E.T., & Berdiev, E.T. (2017). *Technology for growing medicinal plants (tutorial)*. (p.252). Tashkent: UZR FA Minitipography.
3. Akhmedov, E.T., & Berdiev, E.T. (2017). *Technology for growing medicinal plants (tutorial)*. (p.252). Tashkent: UZR FA Minitipography.
4. (2018). *Decree of the president of the Republic of Uzbekistan dated February 14, 2018 No. 3532 PQ "on additional measures for the rapid development of the pharmaceutical network"*. Item 9.1 "establishment of plantations of medicinal plants". Tashkent.
5. (2020). resolution of the president of the Republic of Uzbekistan dated April 10, 2020 No. 4670 PP "on the protection of wild growing medicinal plants, cultivation without culture, processing and rational use of available resources". *The word Halq newspaper*, April 11, No. 75 (7577), p.3.
6. (2020). resolution of the president of the Republic of Uzbekistan dated November 26, 2020 No. 4901 PP-4901 "on measures to expand the scope of scientific research on the cultivation and processing of medicinal plants, the development of their seed production.". *The word Halq newspaper*, November 27, 2020, No. 250 (7752), pp. 1-2.
7. Tukhtaev, B.E. (2009). *the introduction of medicinal plants in the salty lands of Uzbekistan*. dokt. diss., (p.4). Tashkent.
8. Nilov, V.N. (1980). Methods of statistical processing of materials of phenological observations. *Journal of Botany*, 65, No.2. pp.282-284.
9. Dospekhov, B.A. (1985). *Methods of field experiments (based on statistical processing of research results)*. 351 pages.
10. Jumaniyazov, J., Tukhtayev, B., Abdullaev, I., Khudayberganov, N., & Iskandarov, A. (2021). *Assimilation dynamics of saline soil areas by cultivating biomeliorant herbal plant in the lower Amudarya region*. IOP Conference Series: Earth and Environmental Science. IOP Conf. Series: Earth and Environmental Science 939. pp.1-7.
11. Khudaiberganov, N.A., Tukhtaev, B.E., & Abdurakhimov, U.K. (2019). The influence of seed sowing dates on the productivity of calendula officinalis in the soil and climatic conditions of the Khorezm region. *Bulletin of Khorezm Mamun Academy*. 2019-6/1, pp. 37-41.
12. Khudayberganov, N.A., Tukhtaev, B.Y., Babadjanova, S.Kh., & Khabibullo, H.H.A. (2021). The Bioecological Properties of Medicinalpot Marigold (Calendula Officinalis L) In Soil-Climate Condition of Khorezm Region. *Annals of the Romanian Society for Cell Biology*, ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 9265 - 9273 Received 05 March 2021. Accepted 01 April 2021.
13. Khudayberganov, N.A., Tokhtaev, B. Y., Karshibaev, J.Kh., & Jumaniyazov, A. (2022). Matricaria chamomilla L in the saline soils of Khorezm Oasis. prospects for the establishment of plantations of. *Bulletin of Gulistan State University*, Gulistan - 2022. Publishing house" University", 1 (90), pp. 82-87.
14. Khudayberganov, N.A., Tukhtayev, B.Yo., Abdullaev, I.I., Bobakulov, Kh.M., Nishanbayev, S.Z., Babadjanova, S. Kh., & Akhmedov, E.T. (2022). The Chemical Analysis of Climate - Adapted Matricaria chamomilla L. Plant Raw Materials in the Conditions of the Khorezm Oasis. *Jundishapur Journal of Microbiology* Published online 2022 January Research Article Vol. 15, No.1, pp. 661-667.