BIOECOLOGICAL CHARACTERISTICS AND YIELD OF THE LEONURUS TURKESTANICUS

E.T. Akhmedov¹ J.J. Khomidov²
¹Toshkent State Agrarian University,
²Doctoral student of the Forestry Research Institute

The article provides data on the creation of Rosehip plantations according to the 10x2m scheme. It is indicated that perennial medicinal plants (Leonurus turkestanicus) can be grown in the row spacing of the created rosehip plantations. Laboratory seed germination of Leonurus turkestanicus averages 82.5%, and soil germination of seeds is 82.2%. In the first year of the growing season, the height of the plants reaches 30-46 cm and the yield is 0.7-0.8c/ha. The most intensive growth in plants is observed from the second year of the growing season. Generative phases of development are observed in July and continue until the end of September, and the yield of plants is 18-20 c/ha. In the third and subsequent years in plants, the beginning of the growing season is observed from March. At the same time, the height of the plants is 105.7 cm, and the yield reaches up to 25-27c/ha. It was revealed that at the same time, due to agrotechnical measures for medicinal plants in the aisles, a rosehip plantation is formed in parallel and economic efficiency is manifested in the first year of the growing season.

I. INTRODUCTION

It burun namatak and Turkestan Leonurus are valuable natural raw materials included in the Pharmacopoeia of the CIS countries due to their healing properties and practical application. In particular, the annual demand for peanuts in the CIS countries is 6-8 thousand tons, but this demand is met by 50-60%.

The Action Strategy of the Republic of Uzbekistan for 2017-2021 identifies one of the important tasks as "optimization of arable land and their rotation, the introduction of advanced agricultural technologies and increase productivity, increase the production of fruits, vegetables and grapes" [1]. Therefore, it is important to expand scientific research on the cultivation of medicinal and food plants taking into account their biological properties and the development and implementation of new technologies.

In the scientific research of E.T. Berdiev and other authors in the creation of plantations of namatak and other shrubs 3x1.5m; 3x1m; 4x2.5m; 3x1.5m; 3x4m; 4x2m; 4x3m. recommended planting based on the scheme [6.4.].

M. Allayarov and M. The Kholmatovs noted that it was possible to build namatak plantations on a 10x2m scheme and grow medicinal herbs between the rows [2]. Also, by further refining these scientific studies, M.U. Allayarov and others have developed guidelines and recommendations for the organization of industrial plantations of namatak in the new 2x10m scheme in specialized state forestry and the cultivation of medicinal plants in the range [3].

II. OBJECT AND METHODS OF RESEARCH

Simple namatak L. and Turkestan Leonurus (Leonurus turkestanicus v. Krecz. Et Kupr.)

Common Rosacea (Rosa canina L.) - Perennial, 2m, belonging to the family Rosaceae, shrub up to Representatives of Namatak are mainly distributed in the northern part of Europe, their area extends to the east to the Urals, Siberia, the Caucasus and East Asia [5]. In folk medicine and official medicine, its fruits are used in the treatment of vitamin deficiency diseases, urinary incontinence, colds and other liver diseases [7].

Turkestan is a perennial herb of the genus Lamiaeae, reaching 50-150 (sometimes 200) cm in height. Turkestan Leonurus grows in Central Asia, mainly on the rocky and gravelly slopes of the mountains in the middle of the mountains in the mountainous areas of Tashkent, Samarkand and Surkhandarya regions of Uzbekistan [12]. In
In folk medicine it is used as a sedative, in the treatment of heart disease and headaches, and in official medicine it is used in the treatment of cardiovascular neurosis, hypertension and atherosclerosis [7].

Field experiments—Recommendations made in 2009 by the General Directorate of Forestry of the Ministry of Agriculture and Water Resources of Uzbekistan "Shifobakhsh" Medicinal Plants Growing and Recycling Center [3], Main Department of Forestry of the Ministry of Agriculture and Water Resources of Uzbekistan Ornamental Horticulture and Forestry Research and Production Center, Institute of Botany Academy of Sciences of Uzbekistan It was conducted by experts and researchers of the Joint Stock Committee in accordance with the guidelines developed in 2015 [11].

In the study of plant seeds in the laboratory, the seeds of 100 seeds per Petri dish were returned 4 times, and in field conditions in rows of 1.5-2.0 cm. depth was tested by sowing in 4 rows out of 100, and the germinated seeds were calculated as a percentage of the total condition [8,10].

Bioecological properties of plants were determined based on biometric and phenological indicators [9].

A sample pattern and a diagonal method were used to determine the yield in plants. The yield of medicinal plants was collected on the basis of 3 returns at 1 p / m and measured wet. Once the wet weight of the raw material was determined, it was dried and re-measured, and the yield per hectare was determined.

Research results and analysis. The seeds of the Turkestan Leonurus plant have good germination properties and germinate fully in 30-35 days. Experiments have shown that seed germination under laboratory conditions averaged around 82.5% (Table 1).

Table 1: Seed germination of Turkestan Leonurus in laboratory conditions

<table>
<thead>
<tr>
<th>№</th>
<th>Date of sowing (22.02.2014) and control days</th>
<th>Degree of forgetfulness %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 5 10 15 20 25 30</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2 6 12 24 17 17 9</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>1 6 12 15 22 11 11</td>
<td>78</td>
</tr>
<tr>
<td>3</td>
<td>2 6 16 15 21 18 5</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>1 5 17 15 19 14 7</td>
<td>78</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>82.5%</td>
</tr>
</tbody>
</table>

In determining the germination of plant seeds in field conditions, they were tested by sowing in the soil in 2 periods, ie late autumn (November) and spring (April). According to the results of the experiments, the germination of seeds sown in autumn (November) is high, which is 78-82%. At the same time the germination of seeds sown in spring (April) did not exceed 60–63%. In particular, in seeds sown in field conditions in November, the germination rate averaged 82.2%, while in seeds sown in April, these figures were relatively low, around 61-63%. Fertility rates in late fall and spring planted varieties differ from each other (Table 2).

Table 2: Fertility of Turkestan Leonurus seeds sown in spring in field conditions

<table>
<thead>
<tr>
<th>Planted rows</th>
<th>Number of seeds</th>
<th>Time of sowing 15.11.2014</th>
<th>Sprouting (%)</th>
<th>End of germination</th>
<th>Time of sowing 15.04.2014</th>
<th>Sprouting (%)</th>
<th>End of germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>23.03</td>
<td>73</td>
<td>05.04</td>
<td>28.04</td>
<td>63</td>
<td>18.05</td>
</tr>
</tbody>
</table>
According to our analysis, a relative decrease in soil temperature (5-7\(^\circ\)C) in late autumn is not sufficient for seed germination. However, precipitation during this period has a positive effect on seed germination. At this time, the seeds sown undergo a natural stratification process, which results in an increase in germination rate. In seeds sown in the spring, on the contrary, from April onwards, an increase in air temperature (12-17\(^\circ\)C) and a decrease in soil moisture lead to a decrease in these values to 61.2%. That is, seeds sown in the spring require partial stratification (or soaking in water for 1 day) before sowing.

In 2012-2014, in the Chodak section of the specialized forestry named after Abu Ali ibn Sino, industrial plantations were planted on a 10x2m scheme from namatak seedlings (April 5) and Turkestan Leonurus seeds were planted between the rows (Table 3).

Table 3: Scheme of planting Turkestan Leonurus in the row spacing of the namatak plant

<table>
<thead>
<tr>
<th>Sort name</th>
<th>Between the rows, m</th>
<th>Between seedlings in a row, m</th>
<th>Number of seedlings per h/r, pcs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namatak</td>
<td>10</td>
<td>2</td>
<td>500</td>
</tr>
<tr>
<td>Turkestan Leonurus</td>
<td>0.7</td>
<td>7-8 kg (15-20 cm) 5 pcs</td>
<td>71000</td>
</tr>
</tbody>
</table>

Fertility of seeds sown in autumn was 80-85% and storage was 95.8%, and seeds sown in spring (April) were 60-63% and storage was 93.7%.

Observations have shown that in the first growing year, germination and development rates are relatively high in seedlings germinated from seeds sown in the fall. Thus, the plant height was 46.1 ± 1.7 cm, the number of leaves was 24.8 ± 2.9, and the woodiness of the main stem averaged 7.3 ± 1.3 cm. At present, the height of the main stem is 38.3 ± 2.74 cm and the number of leaves is 14.2 ± 1.5. In both variants, wooding of the main stems during the growing season was noted to be around 10-15%. In the first year of Leonurus plant development, it was watered 8-10 times during the growing season and lightly chopped 3-4 times to remove weeds. Experiments have shown that in the first year as a result of keeping such an agrofon on industrial plantations 0.7-0.8 ts per hectare productivity can be achieved (Table 4).

Rapid growth in plants is observed from the second year of vegetation, and the height of the main stem reaches an average of 85.3 ± 4.6 cm, and the number of leaves reaches 42.4 ± 2.1. An average of 8.4 ± 0.7 first-order branches are formed on the main stems, with a length of 12.2 ± 1.4 cm and a number of leaves of 19.2 ± 2.3. The plants grow rapidly during the growing season and bud in mid-July. The main stems of plants grow to 85.3 ± 3.88 cm and have 42-58.4 ± 5.04 leaves. The timber of the main stem is 12.5%. The period of budding and flowering lasts until the end of the growing season. At the end of September, an average of 87.8 ± 4.5 ball buds per 1 plant; 73.6 ± 4.63 ball flowers; 309.0 ± 6.42 formed ball fruits and 302.0 ± 7.39 ripe ball seeds were observed. It should be noted that the height of some plants growing in the experimental area reached 100-130 cm. In the second growing year, 18-20 ts / ha yield is achieved by irrigating 7-8 times in the plantation where the Leonurus plant is planted (Table 4).
In plants, the third and subsequent years of life coincide with the beginning of the growing season in the first days of March. Their main stems grow to 105.7 ± 4.6 cm and form 68.4 ± 5.1 leaves. The woodiness of the main stem is recorded at 12.3 -15.7 cm. During the growing season, they grow rapidly and germinate from late June and early July. The process of budding and flowering in plants continues until the end of September. At the end of September, an average of 137.8 ± 2.22 ball buds per 1 bush plant; 133.6 ± 5.7 ball flowers; 126.0 ± 4.2 formed ball fruits and 504.0 ± 8.5 ripe ball fruits are observed. It was noted that the height of some plants growing in the experimental area reached 150-180 cm. In this year of development, Leonurus plantations were irrigated a total of 7-8 times, and the yield was recorded at around 25-27 ts / ha (Table 4).

According to U.Akhmedov and others, in the first year by watering the plant 7-8 times and giving 110 kg of nitrogen, 80 kg of phosphorus and 60 kg of potassium, 25 ts. and in subsequent years it is possible to harvest 35ts / ha of raw material and 5-6ts / ha of seed, and the Leonurus plant can be stored in one area for 3-4 years [4].

According to the results of our scientific experiments, in irrigated gray soils the Leonurus plant is irrigated 8-10 times in the first year by 0.8-1.1 / ha, in the second year by 7-8 times by 15-18.7 t / ha, and in the third and subsequent years. while 23-25 (28.5) ts / ha by irrigation 7-8 times. can be harvested[13]. Seed yield is 400-555kg / ha in the third and subsequent years. is formed. It was found that a Leonurus plant can be stored for 4-5 years in one field, for example, the yield of plants in the area stored for 5 years is 23-25 ts / ha.

Table 4: Turkestan Leonurus raw material yield of plants

| III. CONCLUSION. |
|---|---|---|

Thus Specialized state forestries have the opportunity to plant Turkestan Leonurus in late autumn and early spring, which consumes 7-8 kg / ha of seeds. Sown seeds germinate from mid-April. In laboratory conditions, the average germination rate is 82.5%, and in field conditions, this figure is around 78-82%. Fertility of seeds sown in spring (April) does not exceed 60–63%. If it is necessary to sow the seeds of plants in the spring, then it is necessary to sow them stratified for 10-15 days at low (3-5°C) temperatures;
Rapid development in plants is observed from the 2nd year of vegetation, when the generative period is recorded. In the third and subsequent years of life, the beginning of the growing season in plants is recorded in mid-March, they develop rapidly and germinate in late June and early July. This process continued in plants until the end of September, with an average of 137.8 ± 2.22 ball buds per 1 plant at the end of September; 133.6 ± 5.7 ball flowers; 126.0 ± 4.2 shaped balls and 504.0 ± 8.5 ripe balls are observed;

Irrigation of industrial plantations on irrigated gray soils by 8-10 times in the first year 0.7-0.8 t / ha, in the second year 7-8 times by 18-20.7 t / ha and in the third and subsequent years 7-8 times through 25-28.5ts / ha. can be harvested from. Seed yield in the third and subsequent years is 400-555 kg per ГА. In our opinion, a Leonurus plant in a field can be stored for 5 years. For example, the yield of the field stored for 5 years is also 23-25ts / ha. formed. In subsequent years, due to mutual competition and aging of plants, the level of productivity decreases sharply (15-18ts / ha).

LIST OF USED LITERATURE
12. Flora of the Uzbek SSR. IV 1959.149.b