International Journal of Psychological Rehabilitation, Vol.24, Issue 07, 2020
`Issn: 1475-7192

Agrotechnics Of Plantation From Seeds Of Silic Sweets (Glycyrrhiza Glabra L)

Abdalova Guliston Nuranovna[1] , Urmanova Munisa Nezamiddinovna[2], **Ajiniyazova Mexriban Koylibaevna[3], Aliev Jurakul Kholikulovich[4] , Toshpulatov Chingizkhan Vali o'gli[5],**

Annotation: *The article presents an analysis of the results of research on agronomic techniques of seedling cultivation from the seeds of smooth licorice (glycyrrhiza glabra L). The analysis of research results on the effect of irrigation regimes on the growth and development of smooth licorice seedlings, the analysis of experimental work on the effects of smooth licorice irrigation regimens and mineral fertilizer rates on winter wheat yields was carried out. The cost-effectiveness of growing seedlings from smooth licorice seeds was also studied by analyzing the results of irrigation procedures, the effect of licorice on soil fertility, as well as the growth, development and yield of winter wheat planted as a follow-up crop after two years of seedlings. Based on the results of the experiment, conclusions and recommendations were developed.*

Keywords*: Sweet licorice (glycyrrhiza glabra L), seeds, seedling cultivation, irrigation regimes, seed seedlings, growth, development, mineral fertilizers, winter wheat, yield, agrotechnical, seedling cultivation, tillage, seedling thickness, green mass, hay, four-year root.*

I. INTRODUCTION

One of the priorities of economic reforms carried out by the government in the agricultural sector is to fully meet the needs of the population in food and other agricultural products, as well as industrial raw materials, to bring the agricultural sector to the level of developed countries. Today, the population is growing in demand for medicinal plants. Therefore, improving the agrotechnics of medicinal plants is a vital necessity.

There are 43.181 million medicinal smooth licorice plants in the world. hectares, and the reserves of biological raw materials amounted to 128.109 mln. tons. The products of this plant are widely used in medicine, food, cosmetics, light industry and agriculture. "Due to the high demand for raw sweets in the world market, its natural area has decreased." In particular, this amount is 2,200 hectares in Azerbaijan (3.6% of the total area), 902 hectares in Kyrgyzstan (1.4%), 27,315 hectares in Kazakhstan (62.6%), 1,763 hectares in Russia (2.9%), and Turkmenistan. - 10776 ha (17.7%), in Tajikistan - 142 ha (0.24%), in Mongolia - 2180 ha (3.5%) [17].

Research is being carried out in countries around the world to meet the declining demand for raw licorice, maintain and increase soil fertility, improve land reclamation, increase the area under cultivated sweet licorice. Although there is a lot of scientific research in developed countries aimed at obtaining ecologically clean, abundant and high-quality crops, maintaining and increasing soil fertility, improving soil reclamation through scientifically based crop rotation systems,

[1] *Tashkent State Agrarian University, Candidate of Agricultural Sciences, Associate Professor*
[2] *Candidate of Agricultural Sciences, Tashkent State Agrarian University.*
[3] *Tashkent State University of Agriculture, Nukus branch*
[4] *Tashkent State University of Agriculture, Department of Agriculture and Land Reclamation.*
[5] *Tashkent State University of Agriculture, Department of Agriculture and Land Reclamation.*

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

seedlings of smooth licorice are grown and then winter wheat is planted. its importance has not been sufficiently studied in the world and in our country.

It is important to conduct scientific research on the efficient use of irrigated lands in the country, the rational use and protection of natural resources, including plants, without disturbing their ancient balance, based on science-based technologies, as well as expanding the area of smooth confectionery using resource-saving technologies. Paragraph 3.3 of the Action Strategy of the President of the Republic of Uzbekistan for further development of the Republic of Uzbekistan for 2017-2021 states that ".. aimed at modernization and accelerated development of agriculture, including the consistent development of agriculture, further strengthening food security, production of environmentally friendly products The necessary strategic tasks have been identified to expand and significantly increase the export potential of the agricultural sector. Therefore, it is important to conduct research on the depth of tillage, fertilizer application, irrigation regimes in the cultivation of smooth licorice seeds and their impact on the growth, development and yield of winter wheat, the results of which are widely applied in practice [1].

The object of the study was a typical irrigated gray soil in Tashkent region, smooth licorice (Glycyrrhiza glabra L), winter wheat variety "Kroshka".

II. **RESEARCH METHODS**.

In practice, all observations, analyzes and calculations were carried out according to the generally accepted guidelines "Methods of field experiments", "Methods of agrochemical, agrophysical and microbiological research in irrigated cotton growing areas" and "Methods of agrochemical analysis of soils and plants." Mathematical and statistical analysis of the results of the experiments was performed using the method of B.A. Dospekhov using Microsoft Excel.

The use of proven methods in conducting field and laboratory experiments, mathematical and statistical analysis of the data obtained and the relevance of the theoretical results to practical results, the comparison of experimental results with local and foreign scientific research, the positive assessment of the collected data by experts.

Part of the experiment.

Field experiments were conducted at the research and training station of Tashkent State Agrarian University in Qibray district. In Experiment 1, 9 variants were used for 3 variants (tillage methods) on mineral fertilizer norms. The total area of the experiment was 2592 m2.

In Experiment 2, 4 with 3 reversible 3 variant controls on smooth candy irrigation regimens. The experiment of planting wheat after smooth sweetening consisted of 12 variants. A 1 m wide protection zone was left between the experimental plots.

In the cultivation of seedlings from the seeds of the smooth licorice plant, in determining their growth and development, M.M. Badalov's "Recommendations for Red Seed Propagation" were used. Phenological observations in smooth sweetness were carried out by studying the underground parts of plants, determining the yield of seeds by the method of OA Ashurmetov.

In the agrochemical analysis of the soil: the amount of humus in the soil was determined by I.V. Tyurin, total nitrogen, phosphorus, potassium I.M.Maltseva and L.P.Gritsenko, the amount of exchangeable potassium was determined by the methods of V.P.Protasov. During the application period, pre-irrigation soil moisture was observed and irrigated in comparison with the irrigation regime and ChDNS. Irrigation norms were determined using Chippoletti water meters with a width of 0.5 m (sewage 0.25 m) [7].

Smooth sweetness was detected in all variants on the surface green mass and seedling yield, as well as in the repetitions of grain and straw yields of winter wheat. In this case, samples were taken from 3 points (1m2) of each plot and converted to 1. The accuracy and reliability of the data obtained on productivity indicators were analyzed mathematically and statistically

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

using the variance method of B.A. Dospekhov using Microsoft Excel. Expenditures and net income were calculated using the method "Methodology for determining the economic efficiency of the results of scientific research in agriculture."

We conducted a number of research experiments on the effect of irrigation regimens on the growth and development of smooth licorice seed seedlings. It is known that irrigation regimens affected not only the higher growth of the stem, but also its thickness, that in variants with higher humidity, the stem was formed higher but thinner, and 5.0 in proportion to the irrigation regime; 5.6 and 5.2 cm, respectively. The number of leaves was also higher in the same irrigation scheme (80-80-75%) and was 15.1. The number of branches on the stem is 12.8; 12.5 and 10.5 pieces, length 8.8; 8.2 and 6.8 cm, and the number of leaves 6.5; 6.2; 6.0 units [6-7].

Irrigation regimes increased from 70-70-65% to 75-75-70% and 80-80-75% compared to ChDNS, changes in plant growth and development were observed, relatively optimal values were obtained from variants with soil moisture 75-75-70% relative to ChDNS . This is also the case with green mass and hay. Under the conditions of 2008, the actual seedling thickness of the smooth candy was around 698.1-701.2 thousand / ha, and in 2009 the seedling thickness was around 1280.0-1300.0 thousand / ha due to the emergence of side stalks. If all the laws are observed, the height before harvesting the plant is 110.8 in proportion to the irrigation regime; 100.8 and 93.4 cm, respectively. High results were obtained from the irrigated variants in the order of 75-75-70% relative to the ChDNS of smooth sweetness.

In the variants with irrigation regimes 75-75-70% and 70-70-65%, the green mass yield was 69.5 and 60.1 ts / ha. The green mass yield of the smooth licorice plant in 2009 averaged 128.5 per variant; 128.8 and 122.3 ts / g, respectively, compared to 2008, which was 59.4 59.3 and 62.7 ts / ha, or twice as much, depending on the biological characteristics of the plant (Table 1).

Irrigation regimes for the licorice plant were determined in 2008-2009. At the end of this experiment, the effect of irrigation regimes and fertilizer rates on winter wheat yields in the field in 2010-2011 was studied [7].

In determining the norms of irrigation of smooth licorice plant are taken into account the periods of complex leaf formation, flowering and ripening, and in winter wheat the periods of accumulation, tubing and milk-wax ripening, and the thickness of soil moisture layers 0-50; 0-70 and 0-50 cm. Irrigation norms for both sweet licorice and winter wheat in the variants with irrigation regimes of 80-80-75% compared to ChDNS are 700.8-910.5 and 560.4 - 729.5 m^3. / ha, seasonal irrigation norms 3871.5- 3848.3 and 3349.9 - 3258.2 m

Option mode	Irrigation procedures in% to ChDNS	Green mass		Average In 2 years	Hay		Average In 2 years
		2008	2009		2008	2009	
2-4	80-80-75	69,1	128,5	98,8	26,5	49,0	37,7
6-8	75-75-70	69,5	128,8	99,1	27,0	49,4	38,2
10-12	70-70-65	60,1	122,3	91,2	23,8	46,5	35,0

In the variants with pre-irrigation soil moisture 75-75-70% compared to ChDNS, irrigation norms increased slightly to 725.5 - 1110.5 and 612.8-923.0 m^3 / ha, seasonal irrigation norms 3811.6-3817.2 and 3164 , 7- 3179.8 m^3 / ha [7].

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

Both in the smooth shirinmiya plant and in the autumn, irrigation procedures in the variants compared to Chdns, seasonal irrigation norms were studied. Now we will analyze the experimental-testing work on the effect of smooth-flow irrigation procedures and the standard of mineral fertilizers on the autumn yield. In the field where seedlings from the seeds of smooth shirinmiya are grown, the effect of the root and angiose residues left in the soil on the degree of germination of autumn leaves, the thickness of the seedlings, the total and fertile stems, the number of grains in a spike, the weight of grain 1000 pieces, quality indicators and the effect on grain yield,

After the autumn seeds were sown in 2010 Year 15 October, the observations began 7 days later (at 22.10) and continued every 3 days. Seed germination in proportion to the follow-up periods in the Control (1) option (not sown before the fall for two years) 17,5; 20,5; 48,1; 66,1; 90,5% in the 2-th variant with the formation of ni, it is indicated that the indicators (on the effect of smooth sweetmia on the leaves, feathers and root residues) are 0,6; 0,7; 2,0; 2,0 and 1,8% higher. Similar indicators were obtained in all other irrigation procedures and fertilizer norms. In 2011 - th year, autumn seeds were sown at 17.10, the observation began at 24.10, and in proportion to the deadlines the indicators were 18,9;
26,5; 46,1; 65,1; and 91,2% (under control), the relatively high indicator of the floor matter of irrigation procedures in the last impact of the smooth shirinm plant $N_{150}P_{100}K_{75}$ fertilizers per kg/ha were obtained in the options used and 20,5; 28,8; 48,2; 67,4; 92,8 % from the control of the organization 1,6; 3,2; 2,1; 2,3; 0,6 % ga high with.

This means that the degree of germination of autumn seeds is determined by the dependence of the smooth sweetness on the influence of partial terrestrial parts and root residues, as well as on the influence of the fertilizer norm.

In the conditions of 2010 - th year, irrigation procedures made 80-80-75% compared to Chdns, fertilizers $N_{200}P_{140}K_{100}$ at the beginning of the period of validity in the 1-th variant used in the norm of kg/ha, the planting thickness of Autumn Leaves is 340,1 m^2 / grain, $N_{150}P_{100}K_{70}$ obtained in the variant applied to kg/ha, the seedlings became thicker than and kilted up to 335,6 m^2/grain. After the wintering, these data were proportionally divided into 299,1 and 304,1 m^2/grain and the amount of those who died was equal to 9,7 and 9,0%. At the end of the validity period, it was stated that it constituted 285,1 and 295,6 m^2/grain. In the research, it was found that in the conditions of 2010-th year, there was only a previous crop effect on the level of fall yields. The effect of irrigation procedures and fertilizer standards was almost not felt[7,8,9].

The irrigation procedure was 90,5; 89,4; 88,1 CM and 98,4; 91,2; 92,1 CM in height in the autumn period of milk- wax and full ripening, depending on the norms of mineral fertilizers at 80-80-75%. Here relatively high indicator mining fertilizers $N_{150}P_{100}K_{75}$ observed when applied in quantities up to kg/ha, 10 cm higher than the control. In this variant, the total number of stalks was 530,5 mg/grain, which was higher than the control 30,4 and 33,8 mg/grain. The highest height of the autumn tree (98,4 CM) irrigation procedures are 80-80-75% and Fertilizers compared to Chdns $N_{150}P_{100}K_{75}$ even if kg/ha was obtained when applied to the norm, the multiplicity of the number of productive bushes ogitlarni was obtained in the same norms, but in the variant where irrigation was conducted 75-75-70% compared to Chdns (6). 1-year fertilizer standards $N_{150}P_{100}K_{75}$ in kg / ha, in 2-th year $N_{200}P_{140}K_{100}$кг/га it is stated that optimal conditions have been created for the growth, development and improvement of the quality of the head of autumn, if used in the norms and irrigation procedures are determined as 75-75-70% compared to Chdns[6,7].

Based on the results of the study, a high yield was obtained when oghitlarni was used in lesser quantities under the influence of the mucilage shirinm plant. The indicator of this (6) variant (57,6 ts/ha) is from control to 8,3 ts/ha, irrigation procedures are 80-80-75% and 70-70-65%, while fertilizers are 1,1 and 3,6 ts/ha higher than the indicator of the variants used in equivalent quantities. At the influence of the leftovers of the Shirinmiya plant on the soil, 1-th year of son50 N150P100K75 kg/ha, at its final impact $N_{200}P_{140}K_{100}$ it is established that the norms per kg/ha are more effective. In all variants, when compared to the average yield of cereals obtained in 2 years, including in control, both

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

relatively high grain yields were obtained when the irrigation procedures were 75-75-70% compared to Chdns. Higher grain yield by fertilizer standard (55,8 ts/ha) $N_{200}P_{140}K_{100}$ kg / ha obtained when used in moderation. In addition, the effect of smooth sweetness from fertilizer (1.5 ts / ha) on control and 7.5 ts / ha of final effects was shown to be 5.1 ts / ha in irrigation regimens.

Relatively high rates of protein and gluten content in the grain are also 75-75-70% of the irrigation regime ChDNS, fertilizers (1 year) $N_{150}P_{100}K_{75}$ kg / ha and (in 2 years) $N_{200}P_{140}K_{100}$ kg / ha were obtained at normal rates and were 15.0% and 0.86 tons; 28.0% and 1.8 tons (2010) and 14.8 and 0.84 tons, respectively; 28.2% and 1.3 tons (2011).

When 2-year-old smooth licorice seed seedlings were harvested, soil residues and mineral fertilizer norms changed after autumn wheat, soil fertility (depending on irrigation regimes) was observed, irrigation regimes were 75-75-70% relative to ChDNS and N150P100K75kg / ha was applied normally (option 6).) the amount of humus is 0.920 - 0.096% in proportion to the soil layers, total nitrogen is 0.130 - 0.099; phosphorus ranged from 0.176 to 0.096 and potassium from 1.810 to 0.990%, and these values were 0.118–0.008, respectively, relative to control; 0.040 - 0.001; 0.007 - 0.001 and 0.110 - 0.010%, and from the initial state 0.028 - 0.000; 0.030 - 0.001; It was found to increase by 0.016 to 0.001%, but the total potassium content decreased by 0.040 to 0.010%. In our view, the main reason for the decrease in the amount of total potassium in the soil is that the demand for this nutrient in the smooth licorice plant is high [7].

We also studied the cost-effectiveness of agro-technical measures used in smooth sweeteners and wheat. Expenditures on one hectare of smooth sweet potato and winter wheat, gross price of cultivated product, average root yield and cost of 1 t of grain grown, conditional net profit per 1 hectare, level of profitability were studied.

It should be noted that the root crop was harvested in 2011 as it was grown in the same field for 4 years due to the biological performance of the smooth licorice plant.

The method of tillage is conditional net profit obtained in the variants carried out by driving at a depth of 20-22 cm, and the yield is 62800 in proportion to the fertilizer standards in the variants carried out chiseling (10-15 cm); 39600; 20639 soums and 3.7; 3.3; Which was 0.6% higher. In this experiment, a relatively high conditional net profit of 337,300 soums / ha and a yield of 33.7% was obtained when the soil was plowed to a depth of 30-35 cm in autumn plowing and mineral fertilizers were applied at the rate of N70P90K110 kg / ha.

The cost-effectiveness of winter wheat planted after 2 years of seed sowing of smooth sweetener was studied in relation to irrigation regimes and fertilizer standards. Over the next 2 years, the cost-effectiveness of irrigation regimes was determined, with a high conditional net benefit compared to control options when the irrigation regime was 75-75-70% compared to ChDNS, with a yield of 144,000 soums / ha and a yield of 20.5%.

Hence, it has been found that good economic efficiency can be achieved even if only wheat is planted. A further increase in economic efficiency was observed when planting smooth licorice before wheat.Relatively high cost- effectiveness irrigation regimes were found in variants with 75-75-70% compared to ChDNS, regardless of the amount of mineral fertilizers used. In this case, the conditional net profit in proportion to the norm of mineral fertilizers is 293,700; 275,250 and 236,150 soums / ha, and profitability 44.7; 39.2 and 32.1 percent, respectively.

The second (2011) high-yield mineral fertilizers for winter wheat $N_{200}P_{140}K_{100}$ conditional net profit for 2 years, although obtained when applied at the rate of kg / ha $N_{150}P_{100}K_{75}$ kg / ha were obtained in the normally used variants and $N_{200}P_{140}K_{100}$ kg / ha was 18,450 soums / ha, and the yield was 5.5% higher.

III. CONCLUSIONS

1. It was found that by propagating the world's declining smooth licorice from seed, it can be included in crop rotation systems in the typical gray soils of Tashkent region to maintain and increase soil fertility and sustainable yields from follow-up crops.

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

2. 26.7 t / ha (0-30 cm) and 32.6 t / ha (30-50 cm) above the 4-year-old smooth licorice plant sown from seed and in accordance with state standards, the optimal conditions for root yield soil 30- Plowed to a depth of 35 cm, the mineral fertilizer was created when N70P90K110 kg / ha was applied in moderation.

3. It was noted that in the cultivation of seedlings sown from the seeds of smooth licorice in two years to obtain relatively high yields of average green mass (99.1 t / ha) and hay (38.2 t / ha), irrigation should be 75-75-70% of ChDNS .Smooth licorice seedlings grown from seed in accordance with 2-year state standards after transplanting from the field, the residuals preserved in the soil are 35.8 t / ha, and the partial root residues are 59.8 t / ha in the 0-30 cm layer of soil. -50 cm at 26.8 t / ha, for a total of 122.8 t / ha, they contain 32 , 9 kg / ha of nitrogen.

4. Irrespective of irrigation regimes, it was found that only in the variants planted with wheat, the humus in the soil decreased by 0.092% from the initial state (1.010%). Relatively high rates of winter wheat smooth sweetness are planted after the cultivation of 2-year seed seedlings, the irrigation regime is 75-75-70% compared to ChDNS, mineral fertilizers $N_{150}P_{100}K_{75}$кг/га were obtained when the norms were applied and were 1.038% higher than the control 0.118% and 0.028% higher than the initial state.

5. Relatively high rates Irrigation regimes in winter wheat planted after two-year smooth licorice seedlings were 75-75-70% compared to ChDNS, and fertilizers were applied in the first year. $N_{150}P_{100}K_{75}$ kg / ha, and in the second year $N_{200}P_{140}K_{100}$ kg / ha was applied at the rate of 57.6 - 53.9 ts / ha, while the average was 55.8 ts / ha in two years. $N_{200}P_{140}K_{100}$ kg / ha were obtained. At the same time, the additional grain yield was 7.5 t / ha from smooth sweet crops, 1.5 t / ha from fertilizers and 5.1 t / ha from irrigation.

6. Mineral fertilizers in winter wheat planted after 2-year seed seedlings of smooth sweetener $N_{200}P_{140}K_{100}$ At the end of the application period, when the irrigation regime was 75-75-70% compared to ChDNS, root and root residues were found to be 36.3 ts / ha, containing 1,600% total nitrogen, 1,280% phosphorus and 2,100% potassium. These figures are 0.310 in proportion to the control; 0.450 and 0.290% higher, respectively.

7. Relatively high conditional net profit for the 4-year average root yield of sweet licorice plant was 337,300 soums / ha and yield 33.7% when the soil was plowed to a depth of 30-35 cm in autumn plowing and mineral fertilizers N70P90, K110 kg / ha were applied. Fertilizers in winter wheat sown after 2 years of seed seedlings (average in 2 years) with a high conditional net profit of 293,700 soums / ha and a yield of 44.7% $N_{150}P_{100}K_{75}$ kg / ha was applied at the rate of 75-75-70% from the ChDNS when irrigation regimens were obtained.

8. To cultivate biennial seedlings from smooth licorice seeds in the conditions of typical gray soils of Tashkent region and apply mineral fertilizers at the rate of N70P90K110 kg / ha by plowing the soil to a depth of 30-35 cm to obtain high root yields and increase soil fertility from four-year plants;

In the cultivation of 2-year-old seedlings of smooth licorice, the irrigation regime should be 75-75-70% of the ChDNS, and for subsequent follow-up crops to obtain a higher grain yield from winter wheat, the irrigation regime should be 75-75-70% of the ChDNS $N_{150}P_{100}K_{75}$ kg / ha is recommended.

Recommendations

Agrotechnics of growing seedlings of smooth licorice seeds in the conditions of typical irrigated gray soils of Tashkent region, based on the results of research on the development of optimal irrigation regimes depending on the norms of mineral fertilizers to increase the yield of winter wheat sown after two years of seedling:

Recommendations for farms on “Cultivation of smooth sweetness” have been developed. As a result, these recommendations will serve as a guide for growing seedlings of licorice seeds in medicinal plants and grain farms of Tashkent region and subsequent increase in crop yields and soil fertility.

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

The technology of growing two- and four-year-old smooth licorice and increasing its root yield and soil fertility has been introduced on a total area of 12 hectares in the conditions of typical gray soils of Tashkent district of Tashkent region. As a result, plow the soil to a depth of 30–35 cm and $N_{70}P_{90}K_{110}$ kg / ha Application agrotechnics to obtain a root crop higher than a smooth sweet potato plant and in accordance with state standards, depending on its final effects, an additional yield of 8.4 ts / ha compared to the control of winter wheat is achieved.

Two-year-old smooth licorice seedlings were transplanted to Zarbdor district of Jizzakh region and introduced on an area of 5 hectares.

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Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019