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INFLUENCE OF SOWING DATES AND NORMS ON SYMBIOTIC ACTIVITY OF “OLTIN DON” CULTIVAR OF LENTIL

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Abstract. This article provides data on the impact of sowing "Oltin don" cultivar of lentil in autumn, spring and summer at the rate of 2.0, 3.0, 4.0 million seeds per hectare on the symbiotic activity of the plant. Sowing date and norm were found to affect the symbiotic activity of lentil varieties. It was noted that the number of nodules and weight per plant decreased with increasing sowing rate. It was observed that the number and weight of nodules increased as the sowing rate per hectare increased.

Keywords: sowing date, sowing norm, “Oltin don”, nodule bacteria, number of nodules, weight of nodules, symbiotic activity, hectare

ВЛИЯНИЕ СРОКОВ И НОРМ ПОСЕВА НА СИМБИОТИЧЕСКУЮ АКТИВНОСТЬ СОРТА ЧЕЧЕВИЦЫ «ОЛТИН ДОН»

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Аннотация. В статье приведены данные о влиянии посева чечевицы сорта «Олтин дон» осенью, весной и летом из расчета 2,0, 3,0, 4,0 млн семян на 1 га на симбиотическую активность растения. Выявлено влияние срока и нормы посева на симбиотическую активность сортов чечевицы. Отмечено, что количество клубеньков и масса растения уменьшались с увеличением нормы высева. Было замечено, что количество и масса клубеньков увеличивались по мере увеличения нормы высева на гектар.

Ключевые слова: срок посева, норма высева, «Олтин дон», клубеньковые бактерии, количество клубеньков, масса клубеньков, симбиотическая активность, гектар

Introduction. Lentils play an important role in legume crops. Lentils are one of the oldest food crops. Lentils contain 23-32% protein, 0.6-2.1% fat, 47-70%

nitrogen-free extractives, 2.3-4.4% ash, 2.4-4.9% tissue and B vitamins available. Lentils are eaten whole, as a groats or flour. The stem contains 6-14% protein. Lentils are very productive and the grain is almost equal in nutrition to beef. Lentils grown in Uzbekistan ripen especially quickly. In the food industry, canned lentils are made. Lentils are one of the most useful fodder crop for livestock. Therefore, increasing grain production in the world and meeting the needs of the population in cereals and legumes, environmentally friendly, protein content remains one of the most pressing issues today.

Lentils are grown for food purposes. The high solubility of the protein in the seeds, with its high taste quality, makes it superior to all legumes in digestibility. The seeds are used in the preparation of various kitchen dishes, including lentil flour and cereals [1; 5-18-b], [2; 41-48-b], [3; 57-59- b], [8; 161-163-b]. Lentils provide an environmentally friendly product, its grain does not accumulate toxins, nitrates, radionuclides [5; 9-21-b].

Methods and materials. Our research was conducted in 2011-2013 in the fields of the experimental plot of the Tashkent State Agrarian University. The soil of the experimental field is a typical sierozem, which has been irrigated for a long time, the mechanical composition is sandy, the groundwater is located at a depth of 15-18 meters.

In our research, the effect of sowing lentil varieties "Oltin don" and "Darmon" in autumn and spring at the rate of 2.0, 3.0, 4.0 million seeds per hectare on the dry mass of the plant was studied.

The research was conducted in the field and in the laboratory, including the placement of field experiments, calculations and observations "Methods of field experiments" (T. UzPITI 2007), "Methods of field experiments (B. Dospekhov, 1985) and" Methods of State Variety Testing of Agricultural Crops " (1985) based on methodological guidelines [4, 6, 7].

Results and discussion. We know that a characteristic feature of legumes is the accumulation of biologically pure nitrogen in the presence of endogenous bacteria at the root of the legume. Biological nitrogen-fixing plants accumulate more protein in their products. The protein formed in the presence of biological nitrogen is environmentally friendly, high quality and gives good results in food and animal husbandry. The studied sowing date and norms were found to affect the development of nodules in lentil varieties. When the Oltin don variety was planted in the autumn, the number of nodules decreased from 10.8 to 9.8 during the budding phase as the

sowing rate increased; During the flowering phase, the number of nodules increased, but as the planting rate increased, the number of nodules decreased from 17.7 to 16.9.

Table 1

Dependence of the number of nodules of Oltin donl varieties on the sowing date and norm, (2011-2013, average)

№	Options		In one bush plant, piece			1 ha area, mln/piece
	Cultivar	Sowing norm, mln. piece/ha	branching	flowering	podded	
Sown in autumn						
1	Oltin don	2	10,8	17,7	20,5	38,7
2	Oltin don	3	10,4	17,4	19,9	56,3
3	Oltin don	4	9,8	16,9	19,5	73,4
Sown in spring						
1	Oltin don	2	9,8	16,6	19,4	36,8
2	Oltin don	3	9,3	16,3	18,8	53,3
3	Oltin don	4	8,8	15,8	18,4	69,5
Sown in summer						
1	Oltin don	2	8,7	15,5	18,3	28,1
2	Oltin don	3	8,3	15,2	17,7	40,1
3	Oltin don	4	7,4	14,7	17,3	50,0

The same pattern was observed during the podding period, when it was 20.5-19.5. At the end of the application period, as the planting rate increased, the number of nodules per bush decreased, but it was found to be higher per hectare. The number of nodules per hectare was 38.7-73.4 million / table (Table 1).

Even in spring sowing, the number of nodules per plant has been decreasing as the sowing rate per plant has increased. Compared to the autumn period, when planted in the spring, the number of nodules was reduced by 1.0 in each variant.

When the Oltin don variety was sown in the spring, the number of nodules decreased from 9.8 to 8.8 during the budding phase as the sowing rate increased. During the flowering phase, the number of nodules increased, but as the sowing rate increased, the number of nodules decreased from 16.6 to 15.8.

The same pattern was observed during the podded period, when it was 19.4-18.4. At the end of the application period, as the planting rate increased, the number of nodules per bush decreased, but it was found to be higher per hectare. The number of nodules per hectare was 36.8-69.5 million / Table (Table 1).

When the Oltin don variety was replanted in the summer, the number of nodules decreased from 8.7 to 7.4 during the budding phase as the sowing rate increased. During the flowering phase, the number of nodules increased, but as the planting rate increased, the number of nodules decreased from 15.5 to 14.7. The same pattern was repeated during the podded period, when it was 18.3-17.3.

The number of nodules per hectare was 28.1-50.0 million / piece. There was a decrease in the number of nodules when lentil varieties were planted in summer compared to the autumn and spring sowing periods (Table 1).

The influence of sowing date and norms on the development of nodules was significant. The nodules were well developed when planted in the autumn, and the nodules were well developed when planted in the spring, but less than in the autumn period. When planted in the summer it is poorly developed due to unfavorable conditions for the development of nodules.

When evaluating the symbiotic activity of lentil varieties, the weight of all bacteria in them is also taken into account. When the Oltin don variety was planted in autumn and reached the budding period, the nodules weighed 0.06-0.04 grams. In all variants, the final weight decreased as the sowing rate increased.

Table 2

Weight of nodules of Oltin don cultivar, gr/bush (average 3 years)

№	Options	branching	flowering	podded	

	Cultivars	Sowing norms, mln. piece/ha				1 hectare area, c
Sown in autumn						
1	Oltin don	2	0,06	0,12	0,16	3,02
2	Oltin don	3	0,05	0,10	0,14	3,96
3	Oltin don	4	0,04	0,08	0,12	4,51
Sown in spring						
1	Oltin don	2	0,05	0,10	0,14	2,66
2	Oltin don	3	0,04	0,09	0,12	3,40
3	Oltin don	4	0,03	0,07	0,10	3,78
Sown in summer						
1	Oltin don	2	0,02	0,05	0,06	1,07
2	Oltin don	3	0,02	0,04	0,05	1,36
3	Oltin don	4	0,01	0,03	0,04	2,60

When the varieties reached the flowering period, the nodules weighed 0.12-0.08 grams, depending on the sowing norm. During the period of podded, this figure was 0.16-0.12 grams, and in all variants it was observed that the weight also decreased due to a decrease in the number of nodules when the sowing rate increased. When the total weight was determined per hectare, it was 3.02-4.52 c / ha (Table 2).

When the Oltin don variety was planted in the spring, the nodules weighed 0.05-0.03 grams at the time of budding. At the time of flowering it was 0.10–0.07 grams. During the podded period, this figure was 0.14-0.10 grams, and in all variants it was observed that the weight also decreased due to a decrease in the number of nodules when the sowing rate increased. When the weight of the nodules was determined per hectare, it was 2.66-3.78 c / ha, which is 0.36-0.74 c / ha less than in the autumn period (Table 2).

When the Oltin don variety was planted in the summer, the nodules weighed 0.02-0.01 grams during the budding period. At the time of flowering, the Oltin don variety weighed 0.05-0.03 grams. During the podded period, this figure was 0.06-0.04 grams, and in all variants it was observed that the weight also decreased due to the decrease in the number of nodules when the sowing rate increased. When the total weight was determined per hectare, it was 1.07-2.60 c / ha (Table 2).

Conclusion. Sowing date and norm were found to affect the symbiotic activity of lentil varieties. It was noted that the number of nodules and weight per plant decreased with increasing sowing rate. It was observed that the number and weight of nodules increased as the sowing rate per hectare increased.

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