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INFLUENCE OF SOWING DATES AND NORMS ON SYMBIOTIC ACTIVITY OF DARMON CULTIVAR OF LENTIL

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ABSTRACT

This article provides data on the impact of sowing "Darmon" 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, “Darmon”, nodule bacteria, number of nodules, weight of nodules, symbiotic activity, hectare

INTRODUCTION

Cereals are richer in protein, essential amino acids and vitamins than cereals, and contain 25-50% protein. Lentils play an important role in cereals. 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 porridge or flour. The stem contains 6-14% protein. Lentils are very productive and the grain is almost equal in nutrition to beef. Lentils are used to make soups and porridges. In cooking, lentils ripen much faster than grains from other legumes. Lentils grown in Uzbekistan ripen especially quickly. In the food industry, canned lentils are made. Lentils are one of the most useful fodder 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.

LITERATURE REVIEW

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-p], [2; 41-48-p], [3; 57-59-p], [10; 161-163-p].

According to Pashchenko L.P., A.A.Olekhnovich, lentils are grown for food purposes. The protein in the seeds is superior to all other legumes in its rapid solubility, delicious quality and digestibility. The seeds are used in the preparation of various

kitchen dishes, including lentil flour and cereals. Lentils are also used in the preparation of bread, bread, pies, hard loaves [9; 297-298-p], [8; 18-21-p].

Lentils provide an environmentally friendly product, its grain does not accumulate toxins, nitrates, radionuclides [5; 9-21-p].

MATERIALS AND METHODS

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. Increasing the amount of protein in the plant by providing it with a high amount of mineral nitrogen increases nitrate in the plant, reduces the quality of the product, alters nitrate metabolism and can lead to many diseases, because nitrate changes the function of hemoglobin and the body lacks oxygen. In the lentil plant, a symbiotic bacterial species, Bradyrhizobium leguminosarum, develops.

The studied sowing date and norms were found to affect the development of nodules in lentil varieties. When the Darmon variety was planted in the fall, the number of nodules decreased from 11.6 to 10.6 as the sowing rate increased. During the flowering phase, the number of nodule bacteria increased, but as the sowing norms increased, the number of nodules decreased from 18.6 to 17.5. The same pattern was repeated during the podded period, when it was 21.3-20.5. At the end of the application period, as the sowing rate increased, the number of nodules per bush decreased, but it was found to be higher per hectare.

Table 1

Dependence of the number of nodules of lentils sown in autumn on the date and norm of sowing, (2011-2013, average)

№	Options		In a per bush plant, piece			In per hectare, mln/ piece
	Cultivar	Sowing rate, mln.piece/ha	branching	flowering	podded	
Sown in Autumn						
4	Darmon	2	11,6	18,6	21,3	40,6
5	Darmon	3	10,9	18,2	20,8	59,4
6	Darmon	4	10,6	17,5	20,5	77,9
Sown in Spring						
4	Darmon	2	10,5	17,5	20,2	38,7
5	Darmon	3	9,8	17,1	19,8	56,6
6	Darmon	4	9,6	16,4	19,4	74,0
Sown in summer						
4	Darmon	2	9	16,4	19,1	29,7
5	Darmon	3	8,4	16	18,7	42,7
6	Darmon	4	8,1	15,3	18,3	53,1

The number of seedlings per hectare in the Darmon variety was 40.6-77.9 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, the number of nodules when planted in the spring decreased by 1.0-1.1.

When the Darmon variety was planted in the spring, the number of nodules decreased from 10.5 to 9.6 during the budding phase as the sowing rate increased. During the flowering phase, the number of nodules increased, but as the planting norms increased, the number of nodules decreased from 17.5 to 16.4.

The same pattern was repeated in both varieties during the growing season, when it was 20.2-19.4. 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 38.7-74.0 million / Table (Table 1).

When lentils were replanted in the summer, the number of nodules decreased from 9.0 to 8.1 during the budding phase as the sowing rate increased. During the flowering

phase, the number of nodules increased, but as the planting norms increased, the number of nodules decreased from 16.4 to 15.3.

The same pattern was repeated during the podded period, when it was 19.1-18.3. The number of nodules per hectare was 29.7-53.1 million.

There was a decrease in the number of lentils when planted in summer compared to the autumn and spring sowing periods (Table 1).

The influence of sowing dates 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 the bacteria in them is also taken into account. When lentil varieties were planted in the autumn and reached the budding phase, the nodules weighed 0.07-0.04 grams. In all variants, the final weight decreased as the sowing rate increased. When the varieties reached the flowering period, the nodules weighed 0.13-0.09 grams, depending on the sowing norm. During the sowing period, this figure was 0.17-0.12 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. The weight of the nodules was 3.24-4.56 c / ha when determined by the weight per hectare (Table 2).

When lentil varieties were planted in spring, the nodules weighed 0.06-0.03 grams during the budding phase. At the time of flowering it was 0.12–0.08 grams. During the podded period, this figure was 0.15-0.11 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. The weight of the nodules per hectare was 2.87-4.20 c / ha, which is 0.29-0.37 c / ha less than in the autumn period (Table 2).

Table 2

Nodules weight of lentil varieties, grams / bush (average 3 years)

	Options		branching	flowering	podded	In per hectare field, c
	Cultivars	Sowing rates, mln. piece/ha				
Sown in Autumn						
	Darmon	2	0,07	0,13	0,17	3,24
	Darmon	3	0,05	0,11	0,14	4,00
	Darmon	4	0,04	0,09	0,12	4,56
Sown in Spring						
	Darmon	2	0,06	0,12	0,15	2,87

	Darmon	3	0,05	0,10	0,13	3,71
	Darmon	4	0,03	0,08	0,11	4,20
Sown in Summer						
	Darmon	2	0,05	0,06	0,07	1,09
	Darmon	3	0,04	0,05	0,06	2,74
	Darmon	4	0,01	0,04	0,05	1,45

When lentils were sown in the summer, the weight of the nodules was 0.05-0.01 grams during the budding period. At the time of flowering it was 0.06–0.04 grams. During the podded period, this figure was 0.07-0.05 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. The total weight was 1.09-2.74 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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