



THE FORMATION OF NODULE BACTERIA ON THE ROOTS, DEPENDING ON THE VARIETIES AND PHASE OF DEVELOPMENT OF CHICKPEA CONDITIONS IN UZBEKISTAN

Mustanov Sobir

Candidate of agricultural sciences, docent
Samarkand branch of the Tashkent state agrarian university.

E-mail: mamasaliyev1991@mail.ru.

Umurzakova Umida

Student of the agronomic faculty of the
Samarkand Institute of Veterinary Medicine

Mustanova Zarnigor Sobirovna

Researcher

Article history:		Abstract:
Received	March 21 th 2021	Use of peanut bacteria (Rizobium) in roots of peanuts and rhizosphere biodegradation of free nitrogen on in the atmosphere, nitrogen nitrogen enrichment, improved nitrogen nitrogen balance in the farm, improved yield of corn, cereals, quality improvement. One of the topical tasks of this day is the study and scientific substantiation of measures aimed at improving the type of product, as well as increasing soil fertility, cultivation, and general plant characteristics by introducing varietal of agriculture, particularly in agriculture.
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INTRODUCTION.

Legumes are of great importance in the production of grain, among them chickpea occupies a special place. The cultivation of chickpeas solves a number of agrobiological problems - increases grain production, solves the problems of animal husbandry in providing forage, is a source in improving soil fertility.

It is well known that root nodule bacteria are formed in the roots of leguminous crops, which fix nitrogen from the air and this provides an improvement in soil fertility. Chickpeas, as a legume crop, contain nitrogen-fixing bacteria (Rizobiumcicer) in the roots, which enrich the soil with nitrogen compounds, improving soil fertility.

According to P.Sh. Shukurullaeva (1969), the size and shape of the nodules are different. The more of them in number and size on the roots of plants, the more nitrogen accumulates in the soil. It was found in experiments that 75% of the accumulated nitrogen is assimilated by the plant, the remaining 25% are accumulated in the soil. In addition, in the protein content of seeds, 5 - 7% is accumulated due to nodule bacteria.

RESEARCH METHODOLOGY.

Nodule bacteria Rizobium in their activity, being in the roots and rhizosphere, biologically assimilate free nitrogen from the atmosphere, which enriches the soil with nitrogen, improves the nitrogen balance in agriculture, while crop rotation crops, corn and other row crops, increase productivity and product quality.

At this stage of development of agriculture, with the formation of more and more farms, the types and quantities of agricultural products are increasing every year. Based on this, it is relevant to study the biological characteristics of chickpea and its introduction into crop rotation, which improves the agrophysical and chemical properties and soil fertility. In addition, it provides a valuable and high-calorie plant product.

The development of the root system is influenced by soil moisture, therefore, lateral, first, second and third types of roots develop well in irrigated zones, which are located mainly in the most fertile part of the soil. The root shank does not penetrate deeply, because of this, the productivity index of the root system is estimated to be high. As a result, the mass and number of formed nodules increases while on the surface of the soil.

The effectiveness of the symbiotic life of nodule bacteria in the roots of chickpea plants is described in the scientific works of Tanno, Ken-ichi; Willcox, George (2006), Yadav, Shyam S .; Redden, R. R .; Chen, W .; Sharma, Balram (2007), Varshney, Rajeev K .; Thudi, Mahendar; Muehlbauer (2018).

In his experiments S.B. Mustanova (1999), Wani, Suhas Pralhad; Rockström, Johan; Oweis, Theib Yousef. Rainfed (2009) found that nodule symbiosis is different for chickpea cultivars. P.Sh. Shukurullaev (1969) determined that nodule bacteria in chickpea roots mainly develop before flowering plants, after flowering they die, forming

organic matter. K.E.Eshmirzaev (1996) note that under irrigation, nodule bacteria in the roots of chickpea are formed before the phase of bean formation.

In our experiments, we studied the mass of nodules on the roots of various varieties of chickpea in the irrigated zone of Uzbekistan.

RESEARCH RESULTS.

Analyzes of the data obtained show that the maximum mass of nodules was observed in the chickpea cultivar Umid, as the average weight of nodules is 17.3 g and this indicator is 8 g higher than in the cultivars Lazzat. In all studied cultivars, the weight of nodules increases in the phase of bean formation. So, on average, in the chickpea variety Umid in the budding phase, the weight of nodules on the roots is 15.0 g, this indicator in the flowering phase was 16.2 g and during the formation of beans it was 17.3 g. Or in the phase of beans formation the mass of nodules is higher 2.3 g compared to the budding phase. A similar pattern is observed in other varieties of chickpea.

Table 1
Formation of nodules of various varieties of chickpea in the conditions of Uzbekistan (average 3 years)

Varieties	The mass of nodules, g		
	budding	flowering	bean formation
Lazzat	8,7	9,5	9,9
Uzbekistan 32	7,5	8,2	8,6
Yulduz	14,9	15,9	16,4
Umid	15,0	16,9	17,3
K- 295	12,9	14,1	14,7
K- 296	11,1	12,4	12,9

This indicator was: for the Yulduz variety - 16.4 g; in the K-295 variety - 14.7 g, in the K-296 variety - 12.9 g, in the Lazzat variety - 9.9 g, in the Uzbek variety - 32 - 8.6 g.

Thus, the lowest indicator by the weight of nodules was observed in the varieties Uzbekistan - 32, while the average weight of the nodules compared to the indicator of the variety Umid is lower by 8.7 g. Regularities of the data obtained by years were not noted by the weight of nodules.

CONCLUSION.

Thus, we can conclude the following conclusions, in the conditions of irrigated agriculture in Uzbekistan, chickpea is an important crop that improves soil fertility and provides a valuable food product.

The formation of nitrogen-fixing nodules in chickpea culture depends on many agro-climatic and agrotechnical factors. Among them, air temperature, soil moisture and the cultivated variety of plants are important.

Under the conditions of Uzbekistan, the air temperature of + 15 ... + 20 ° C is optimal for the effective formation of chickpea nodules; under these conditions, the maximum weight of nodules is observed in the Umid variety.

REFERENCES

1. Shukurullaev P.Sh. The development of nodule bacteria on the roots of chickpea // Tashkent. - 1969. - 5 p.
2. Eshmirzaev K.E. Biology and breeding of leguminous crops in Uzbekistan. // Tashkent. - 1996., - 129 p.
3. Mustanov S.B., Umurzokova U.E. Activity of nodule bacteria on chickpea roots in Uzbekistan. // Innovative approaches in modern science. // - 5 (41), - Moscow, 2019. - pp. 45-48.
4. Tanno, Ken-ichi; Willcox, George. The origins of cultivation of Cicer arietinum L. and Vicia faba L. : early finds from Tell el-Kerkh, north-west Syria, late 10th millennium b.p. // Vegetation History and Archaeobotany. - 2006. - Vol. 15, no. 3. - P. 197-204.
5. Yadav, Shyam S .; Redden, R. R .; Chen, W .; Sharma, Balram. Chickpea Breeding and Management. - CABI, 2007 .-638 p.
6. Varshney, Rajeev K .; Thudi, Mahendar; Muehlbauer, Fred (Eds). The Chickpea Genome. - Springer, 2018 .- 142 p.
7. Wani, Suhas Pralhad; Rockström, Johan; Oweis, Theib Yousef. Rainfed Agriculture: Unlocking the Potential. - CABI, 2009 .- 328 p.
8. Muratov, O. K., Ismailov, A. I., & Ostonakulov, T. E. (2020). Isolation of Varieties and Heterotic Hybrids of Tomato with a Growing Season of 75-90 Days in Repeated Cultivation. *International Journal of Progressive Sciences and Technologies*, 22(2), 93-95.
9. Ostonakulov, T. E., Ismoilov, I., & Nabiev, C. K. (2020). CROPIING VARIETIES OF SUGAR CORN SHERZOD AND ZAMON AT DIFFERENT MODES OF IRRIGATION AND FERTILIZER RATES. In *Приоритеты мировой науки: эксперимент и научная дискуссия* (pp. 28-33).
10. Eshimovich, O. T., & Isroilovich, I. A. (2019). Peculiarities of the accelerated methodology of elite seed production of early and medium-determined varieties of potato and their productivity in reproduction. *International Journal of Innovative Technology and Exploring Engineering*, 8(6), 699-702.

11. Eshonkulov, B., Ergashev, I., Normurodov, D., & Ismoilov, A. (2015). Potato production from true potato seed in Uzbekistan. *International Journal of Current Microbiology and Applied Sciences*, 4(6), 997-1005.