



## The Role of Legume Crops in Improving the Ecological State of the Soil

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ARTICLE INFO	ABSTRACT
Published Online: 17 January 2022	In this article is considered the role of legumes in improving the ecological state of the soil and the problem of developing energy-efficient, inexpensive, biologically and environmentally clean production technologies for crop production. The use of valuable chemical fertilizers and pesticides in order to obtain high yields from crops increases the pollution of the environment, ie soil, air and groundwater, the products contain nitrates, herbicides, fungicides, insecticides, residues harmful to human health.
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### INTRODUCTION

The use of valuable chemical fertilizers and pesticides in order to obtain high yields from crops increases the pollution of the environment, ie soil, air and groundwater, the products contain nitrates, herbicides, fungicides, insecticides, residues harmful to human health. High levels of nitrogen fertilizers are harmful to the environment when applied to plants. Decomposing organic matter activates the activity of soil microflora, reduces the amount of humus in the soil. Some of the nitrogen is added to the water bodies and some to the groundwater. Nitrogen in the form of nitrate in food and feed increases, and they lead to disruption of metabolism, locomotor, nervous system activity, heredity in plants, animals and humans.

Nodular bacteria living in the roots of legumes accumulate biological nitrogen, and they improve the amount of organic matter in the soil, the water-physical properties of the soil, increase soil fertility. Nitrogen accumulated in legumes is biological nitrogen, which prevents the accumulation of nitrates in plant products, the growth of harmful microflora that rapidly decompose organic matter in the soil, as well as the cultivation of pure products. There are a lot of research on technologies for the cultivation of products using low-nitrogen fertilizers, non-accumulating, perishable pesticides, which do not accumulate in plants, while maintaining the ecological balance, without polluting the soil, wastewater, groundwater with toxic substances. We have also worked on similar studies.

### MAIN BODY

Growing peas in irrigated lands enriches the soil with biological nitrogen and organic matter, improves the water-physical properties of the soil, increases its fertility, while meeting the needs of the population in protein.

Mankind cannot give up high yields of field crops. In the future, as the productivity of field crops increases, so will their demand for nitrogen. Biological nitrogen increases crop yields and eliminates the harmful effects of nitrogen on the environment. One such biological nitrogen-fixing legume is the pea plant.

Peas, like other legumes, enrich the soil with nitrogen compounds using nitrogen-fixing bacteria (*Rhizobium cicer*) located at the roots and increase soil fertility. (I.H.Hamdammov, M.Xaitova, 2005). According to P.Sh. Shukurullaev (1969), all bacteria in pea root develop before flowering. After flowering, the bacteria die and the buds break down and organic matter begins to accumulate at its base. However, I.H. Hamdamov, M. Khaitova (2005) and Polikarpova (2008) note that the formation of nodular bacteria in pea root continues until the budding phase. Even according to Polikarpova (2008), the largest number of nodes corresponded to the phases of the nodule. According to him, the number of nodules in the root was 154 in the flowering phase when 0.6 million seeds per hectare were sown in 1m<sup>2</sup> area, while in the flowering period this figure was 134. Taking this into account, we also studied the effect of sowing dates on the formation of nodules at the root of pea varieties Yulduz, Uzbekistanskiy-32 and Umid.

We conducted field experiments in the conditions of gray soils of Samarkand region. The experimental area was 1875.2 m<sup>2</sup>, the calculation area was 1800 m<sup>2</sup>, and the area of 1 pile was 25 m<sup>2</sup>, which was carried out in four repetitions. During the experiment, peas were watered 3 times - (growth period), - budding - in the stages of gross flowering. 600-700 m<sup>3</sup> of water per hectare was given at each irrigation. In the experiment, Yulduz, Uzbekskiy-32 and Umid varieties of peas were taken as objects.

### RESULTS AND DISCUSSIONS

In our study, it was found that the weight of the nodule formed in the pea root changes with the delay of planting times. For example, the average weight of chickpeas planted in the Umid variety, planted for an average of three years, was 13.8 grams on 23 February, compared to 15.9 on 5 March; 15.3 on March 15, 13.2 on March 25, 12.0 on April 5, and 11.9 grams on April 15. The optimal time for nodule roots formation was in the variant planted on March 5, and it was found that when planted on late April 15, the weight of the nodule formed in the roots was 4.0 grams more. A similar pattern was observed in Yulduz and Uzbekistan-32 varieties. When we analyzed the formation of nodules by plant phases, the greatest nodule weight was observed in the legume phase. For example, when the Umid variety was planted on February 23, the average weight of the nodule was 12.2 grams in the budding phase, 12.9 grams in the flowering phase and 13.8 grams in the budding phase. Or it was observed that the average weight of the nodule in the budding phase was 1.6 grams more than the weight of the nodule in the budding phase and 0.9 grams more than the weight of the nodule in the flowering phase. Such regularity was observed in all sowing periods and in the studied varieties. When analyzing the nodule by variety, the average nodule weight in three years was shown in the Umid variety, which was 16.5 grams when planted on 5 March. The star variety weighed 15.9 grams, and the Uzbek-32 variety weighed 15.3 grams. In other words, it is 0.6 grams more than Yulduz and 1.2 grams more than Uzbekistan-32. The fact that the nodule continues to the pea plant until the budding phase means that the soil moisture and temperature are at an optimal level.

### CONCLUSION

The weight of the tuber formed at the root of the pea differed not only among the varieties, but also in terms of sowing dates and developmental phases that is, among the varieties, the Umid variety was recorded on March 15 for all varieties in terms of sowing periods, the most leguminous phase when analyzed by plant development phases. When the Umid variety of pea is planted on March 15, it is a source of biological nitrogen for past crops in increasing soil fertility and crop rotation by assimilating free nitrogen from the air and helping to solve the problem of developing clean crop cultivation technologies.

### REFERENCES

1. G.A.Suvonova E.I.Xamdamaeva E.Z.Isoqova The effect of agrotechnical action on the biological properties of pea varieties /“Development issues of innovative economy in the agricultural sector” International scientific-practical conference on March 25-26, 2021. Web: <http://conference.sbtsue.uz/uz> <https://ijmmu.com/index.php/ijmmu/article/view/2673> <http://papers.conference.sbtsue.uz/index.php/DIIEAS/article/view/80>
2. G.A.Suvonova E.I.Xamdamaeva. The effect of planting times on the development of the root system of pea varieties /“Development issues of innovative economy in the agricultural sector” International scientific-practical conference on March 25-26, 2021. Web: <http://conference.sbtsue.uz/uz> <http://papers.conference.sbtsue.uz/index.php/DIIEAS/article/view/82/73>
3. Elnura Iskandarovna Xamdamaeva; Guzal Asrorovna Suvonova; Ezozkhon Zokirovna Isokova. INFLUENCE OF SEEDING TIME ON THE DEVELOPMENT OF THE ROOT SYSTEM OF CHICKPEA VARIETIES//Asian Journal of Multidimensional Research (AJMR). ISSN: 2278-4853. Vol 10, Issue 4, April, 2021. Impact Factor: SJIF 2021 = 7.699. DOI:10.5958/2278-4853.2021.00252.4–pp.368-372. [https://www.tarj.in/Ajmr\\_Current\\_Issue.html](https://www.tarj.in/Ajmr_Current_Issue.html) <https://www.tarj.in/images/download/ajmr/AJMR-APRIL-2021-FULL-JOURNAL.pdf>
4. I. Xamdamaev S. Mustanov, G. Suvonova, M. Dzhumaev. Influence of sowing dates on the root system of chickpea. // Karshi. May 14-15. conf. mat. 2018 th
5. I.K.Kamdamaev, S.B. Mustanov, Z.S. Bobomuradov. Sukoriladigan erlarda nkhat ethishtirishning ilmiy asoslari. // Monograph. Toshkent. "Fan". 2007.
6. Mustanov Sabir Bolievich, Suvonova Guzal Asrorovna, Berdimurodov Dostonbek Khudoikul oglu / BIOLOGICAL NITROGEN / India A Sian Journal of Multi-dimensional Research ISSN: 2278-4853 Vol 9, Issue 3, March, 04.2020. № 11
7. Suvonova G. Influence of sowing dates on the morpho-biological properties of pea varieties. / Proceedings of the international scientific-practical conference "Current issues in the cultivation of agricultural crops and prospects for its development", dedicated to the 85th anniversary of Professor Atabaeva Halima Nazarovna and the 67th anniversary of scientific and pedagogical activity / Part 1. January 10-11, 2020. 383 b
8. Suvonova G.A. / Cultivation of biologically and ecologically clean products / Land of Uzbekistan /

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scientific-practical and innovative magazine.  
Number 1. 2020

9. S.Mustanov, G.Suvonova. Biological characteristics of seeds of pea varieties ”Journal of Agriculture and Water Management of Uzbekistan 2020y. 3 son. Page 37
10. Dzhumaev M.M., Suvonova G.A. Influence of sowing dates on the root system of chickpea/ Prospects for the development of veterinary and animal husbandry: Modern practice and innovative technologies / Proceedings of the Republican scientific-practical conference. Part II May 21-22, 2020.
11. Suvonova G.A., Kholmurodova M. / Influence of sowing dates on the biological properties of pea varieties. Science and innovations in the conditions of modern Uzbekistan ”/ Materials of the Republican scientific-practical conference. Part II - Nukus: "Science". 2020. 38-b.
12. Suvonova G.A. Cultivation of biologically and ecologically clean products / Land of Uzbekistan / scientific-practical and innovative magazine. Number 1. 2020