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**INFLUENCE OF SEED SOWING TIMES AND SOWING SYSTEMS ON THE HEIGHT  
AND ROOT SYSTEM OF PEACHE PLANT ON THE FORMATION OF TUBERS.**

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**Abstract.** In the article, in the conditions of dark sierozem soils of the mountainous regions of the Jizzakh region, the plant height of the "Zabardast" pea variety and the formation of nodule bacteria in the root system were determined by sowing dates (1-10.04 and 11-20.04), planting rates 185; 222 and 278 thousand plants/ha) and the influence of sowing schemes were studied and scientifically substantiated.

**Keywords.** Chickpea, sowing date, sowing rate, sowing method, plant height, root system, nodule bacteria.

**Introduction.** Peas is a protein-rich legume crop, and the cultivation of this crop, along with solving the protein problem, contributes to the preservation and increase of soil fertility, ensuring the production of environmentally friendly products. Peas accumulate large amounts of organic matter in the soil and also improve the nitrogen balance in agriculture. It converts difficult-to-dissolve phosphates into a form that plants can assimilate and ensures the production of additional protein on the surface. When analyzing the results of scientific research conducted in this area, it is necessary to positively resolve such important and urgent issues of agriculture as providing the population with food products rich in important proteins, creating and introducing advanced technologies for obtaining high and quality yields of crops in various soil and climatic conditions.

Products obtained from leguminous crops play an invaluable role in ensuring abundance on our people's tables. Such plants, in particular, peas, green peas, soybeans, lentils, beans, mung beans, and many other leguminous crops, are considered plants that have the ability to accumulate a large amount of biological nitrogen in the soil [5].

Since ancient times, chickpea seeds have been used not only for food but also for medicine. Heating chickpea flour was also used to treat certain pains [6]. When consumed by humans, the products obtained from this plant not only make a significant contribution to providing them with protein-rich and nutritious microelements, but also have the ability to leave a large amount of biological nitrogen in the soil in an environmentally friendly state for future preceding crops. [7].

Pea plants, like other leguminous crops, have the ability to synthesize protein compounds in the grain as a result of better absorption of nitrogen from the air through root tubers. [8]. Also, the pea plant has the ability to leave about 50 kg of pure biological nitrogen in the soil through nodule bacteria for subsequent crops. [9].

**Research methods.** Placement of field experiments UzPITI method 2007 [1], phenological observations according to the international classifier developed by the Russian Institute of Plant Industry SEV Triticum species (1984) [2] method, biometric measurement work according to the

method of the State Variety Testing Commission of Agricultural Crops (1989) [3], by drying soil moisture using a thermostat at a temperature of 105 °C for 4-6 hours, agrophysical properties of soils according to the manual "Методы агрофизических исследований почвы Средней Азии" (1973) [4], the humus content of the soil was determined according to the method of I.V. Tyurin, the total amount of nitrogen and phosphorus according to the method of P.P. Gritsenko, I.M.Maltseva, nitrate nitrogen according to Grandvald-Lyaju, mobile phosphorus according to the method of B.P.Machigin, and the amount of exchangeable potassium according to the method of P.V.Protasov.

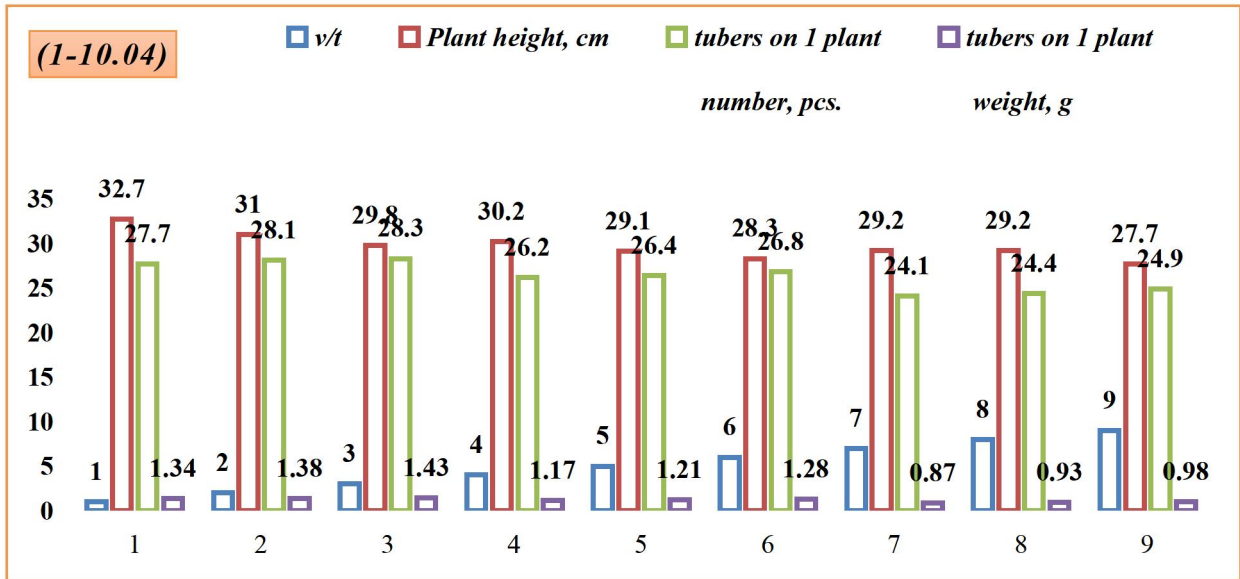
Field experiments were conducted under the conditions of dark sierozem soils of the Scientific research institute of rainfed agriculture Bakhmal experimental station. When determining the agrochemical composition of the soils of the experimental field, the humus content in the 0-20 cm layer was 1.283%, and in the 20-40 cm layer - 1.201%, which decreased with the descent into the lower horizon. It was established that the amount of gross nitrogen in the 0-20 and 20-40 cm layers is 0.085-0.081%, phosphorus 0.115-0.146%, and potassium 1.28-1.13%, which decreased in the lower layers. The amount of mineral fertilizers in the mobile form (nitrate nitrogen, mobile phosphorus, and exchangeable potassium) varied in the experimental field, and the amount of nitrate nitrogen in the 0-20 and 20-40 cm layers was 80.2-71.5 mg/kg, mobile phosphorus 15.0-121.0 mg/kg, and exchangeable potassium 276.9-240.8 mg/kg, respectively (1-table).

**1-table**

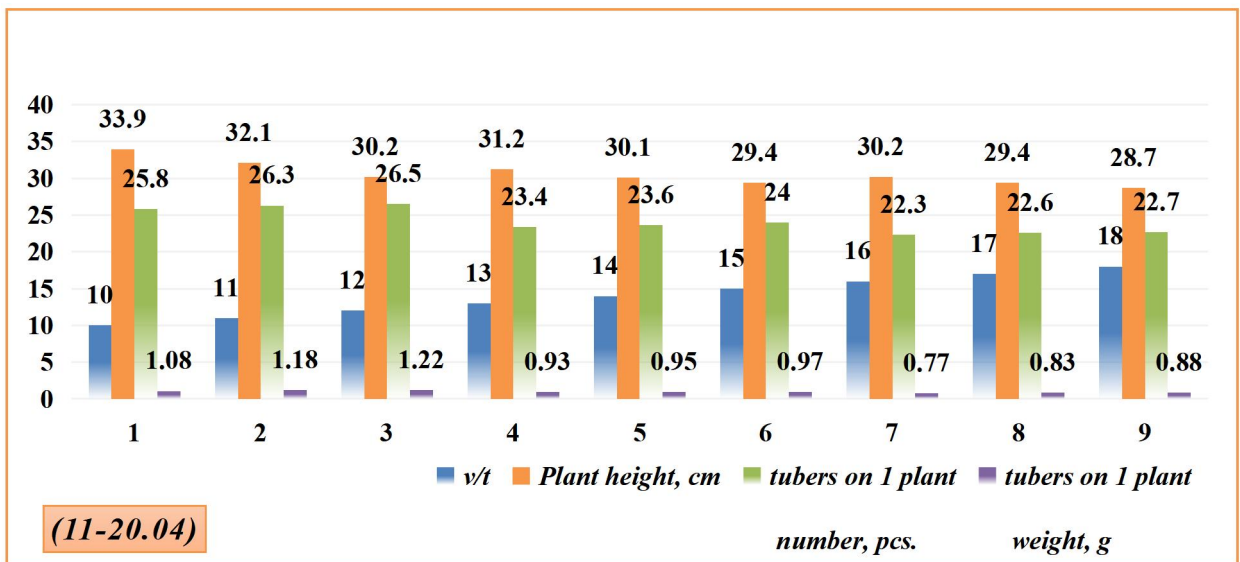
***Agrochemical composition of the soil of the experimental field, Bakhmal 2025.***

Soil horizons, cm	Humus content, %	Overall forms, %			Mobile form, mg/kg		
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N-NO <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
0-20	1,283	0,085	0,155	1,28	80,2	15,0	276,9
20-40	1,201	0,081	0,146	1,13	71,5	12,0	240,8

**Research results.** According to the results of the conducted research, when studying the number of tubers in the plant height and root system of the "Zabardast" pea variety, the seeding rate was 185 thousand germinating seeds, and in the 1st, 2nd, and 3rd variants, sown according to the 30x18x1, 45x12x1, and 60x9x1 planting schemes, the plant height averaged 29.8-32.7 cm/ha, the number of tubers in the root of 1 plant averaged 27.7-28.3 pieces, and the number of tubers in the root system averaged 27.7-28.3 pieces, in variants 4, 5 and 6, with a seeding rate of 222 thousand germinating seeds and sowing schemes of 30x15x1, 45x10x1, and 60x7.5x1, the plant height averaged 28.3-30.2 cm/ha, the number of tubers per plant root averaged 26.2-26.8 pieces, in variants 7, 8 and 9, with a seeding rate of 27.8 thousand germinating seeds and sowing schemes of 30x12x1, 45x8x1, and 60x6x1, the average plant height was 27.7-29.2 cm/plant, and the number of tubers per plant root averaged 24.1-24.9 pieces (figure 1).



**Figure 1. Tubers in plant height and root system, Baxmal 2025**



**Figure 1. Tubers in plant height and root system, Baxmal 2025.**

According to these indicators, when sowing at the second sowing date of the experiment 11-20.04, the seeding rate was 185 thousand germinating seeds, and in variants 10, 11 and 12, sown according to the 30x18x1, 45x12x1, and 60x9x1 sowing schemes, the plant height averaged 30.2-33.9 cm/ha, the number of tubers per plant root averaged 25.8-26.5 piece, in variants 13, 14 and 15 with a seeding rate of 222 thousand germinating seeds and sowing schemes of 30x15x1, 45x10x1, and 60x7.5x1, the plant height averaged 29.4-31.2 cm/ha, the number of tubers per plant root averaged 23.4-24.0 pieces, in variants 16, 17 and 18, with a seeding rate of 27.8 thousand germinating seeds and sowing schemes of 30x12x1, 45x8x1, and 60x6x1, the plant height averaged 28.7-30.2 cm/plant, and the number of tubers per plant root averaged 22.3-22.7 pieces (figure 2).

**Conclusion.** As can be seen from the results of the conducted research on the formation of tubers in the roots of the "Zabardast" pea variety with optimal planting dates and plant density, it was established in the experiment that with a delay in planting dates and an increase in plant density, the number and weight of tubers per plant also changed and decreased.

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