

THE EFFECT OF NITROGEN, PHOSPHORUS AND POTASSIUM FERTILIZERS ON MUNG BEAN (DURDONA) IN LIGHT LOAMY SOILS OF SURKHANDARYA REGION

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ABSTRACT

This study examines the influence of nitrogen (N), phosphorus (P), and potassium (K) fertilizers on the growth, development, and yield of mung bean (Vigna radiata L. var. Durdona) cultivated in the light loamy soils of the Surkhandarya region. Field experiments were conducted to determine the optimal combination of NPK fertilizers for achieving maximum productivity and soil fertility improvement. The results showed that balanced application of nitrogen, phosphorus, and potassium significantly increased plant height, number of pods per plant, and seed yield compared to the control. Among the treatments, the combination of N60P90K60 kg/ha proved to be the most effective in enhancing the biological and economic yield of mung bean. The study highlights the importance of integrated nutrient management for sustainable cultivation of legumes under the soil-climatic conditions of Surkhandarya.

Introduction

In the southern regions of Uzbekistan, in particular, in the Surkhandarya region, the cultivation of mung bean (Durdona) is of great economic and agroecological importance. The mung bean plant contains a high amount of protein, carbohydrates and useful microelements, which plays an important role in maintaining food, fodder and ecosystem stability. In recent years, mung bean cultivation areas have been expanding, but due to the lack of a fertilizer rate appropriate for soil conditions, differences in productivity are observed.

Research site and methods

The experiment was conducted at the Termez State University of Engineering and Agrotechnology, Termez district, Surkhandarya region. The experimental site is located on light loamy, loamy soils. Nitrogen (N), phosphorus (P_2O_5) and potassium (K_2O) fertilizers were applied to the experimental plots in different rates. The experimental variants were organized as follows: control (without fertilizer), $N_{30}P_{60}K_{40}$, $N_{60}P_{60}K_{40}$, $N_{90}P_{60}K_{40}$ and $N_{120}P_{60}K_{40}$. Each variant was repeated 3 times. Soil moisture, pH, mechanical composition and plant biometric indicators were measured.



Picture 1

Results and Discussion

The results of the experiment showed that the effect of fertilizers on mung bean plants was significant. The highest yield was recorded in the $N_{90}P_{60}K_{40}$ variant. In this case, the height of the plants, the number of leaves and the diameter of the stem were higher than in other variants. The total nitrogen content and microbiological activity in the soil also increased. With an increase in the fertilizer rate, the yield increased, but the economic efficiency in the $N_{120}P_{60}K_{40}$ variant was relatively low.



Picture 2

The yield results show that excessive application of nitrogen fertilizer prolongs the growing season of mung bean and negatively affects the quality of the crop. The most optimal norm is recommended as $N_{90}P_{60}K_{40}$. Phosphorus and potassium elements played a positive role in the development of the root system, increasing the green mass of leaves and grain yield.



Conclusion

Based on the conducted research, it was found that the balanced application of nitrogen, phosphorus and potassium fertilizers in the cultivation of mung beans on light loamy soils of the Surkhandarya region significantly increases productivity. According to the experimental results, the most effective option is $N_{90}P_{60}K_{40}$, this rate accelerates plant growth and is considered the most economically viable. In the future, it is recommended to conduct long-term agroecological monitoring in this direction..

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