# THE INFLUENCE OF MINERAL FERTILIZER RATE AND PROPORTIONS ON THE DEVELOPMENT PERIOD OF MUSHROOM PLANT

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***Abstract.*** *This article studies the effect of mineral fertilizer rates and their ratios on different stages of development of mung bean (Vigna radiata). The study analyzes the effect of optimal amounts of basic fertilizers such as nitrogen, phosphorus and potassium and their ratios on the vegetative growth, flowering and fruit setting stages of mung bean. Also, physiological changes observed as a result of increasing or decreasing the rate of fertilizers, differences in yield and quality are determined. The article offers scientific and practical recommendations aimed at forming an effective fertilization system in mung bean cultivation, improving agrotechnical measures and ensuring environmental sustainability.*

***Keywords****: mung bean, mineral fertilizers, fertilizer rates, fertilizer ratios, development stages, productivity, agrotechnics, environmental sustainability.*

# ВЛИЯНИЕ НОРМЫ И КОЛИЧЕСТВА МИНЕРАЛЬНЫХ УДОБРЕНИЙ НА ПЕРИОД РАЗВИТИЯ ГРИБНОГО РАСТЕНИЯ

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***Абстрактный****. В статье изучается влияние норм внесения минеральных удобрений и их соотношений на различные фазы развития растений вигны лучистой (Vigna radiata). В исследовании анализируется влияние оптимального количества основных удобрений, таких как азот,*

*фосфор и калий, а также их соотношений на вегетативный рост, цветение и стадии завязывания плодов маша. Он также выявляет физиологические изменения, урожайность и различия в качестве, наблюдаемые в результате увеличения или уменьшения норм удобрений. В статье даны научно-практические рекомендatsiu, направленные на формирование эффективной системы удобрения при возделывании маша, совершенствование агротехнических мероприятий и обеспечение экологической устойчивости.*

***Ключевые слова:*** *маш, минеральные удобрения, нормы удобрений, соотношения удобрений, стадии развития, урожайность, агротехника, экологическая устойчивость.*

**Introduction.** Today, the issue of food supply in all countries of the world has become one of the priority tasks. In particular, due to the global warming process taking place on our planet, floods are occurring in some regions, and in some regions, an extreme water shortage, and the increase in various natural disasters, primarily have a negative impact on the agriculturalctor.

In terms of regularly providing the world's population with food products, in our republic, due to favorable soil and climatic conditions, there are opportunities to grow high-quality crops up to two times a year, up to two times a year, by planting corn, mung beans, soybeans, rice, millet, sesame, fodder crops, potatoes and various vegetables as repeated crops for 120-130 days on more than one million irrigated areas that are annually freed from cereal crops. Currently, in our country, great attention is paid to grain, leguminous, and oilseed crops, and the cultivated areas are being expanded.

Great opportunities have opened up for the development of agriculture and the productive use of land. Today, one of the main problems is the issue of protein, that is, satisfying the human demand for protein. Of the leguminous crops, mung bean is of great importance in solving this problem.

In the conditions of our republic, 60-70 t/ha of grain is grown from winter wheat, and 15-20 t/ha from mung bean, which is grown as a repeated crop, is grown, and there are opportunities to increase the grain yield produced during one season to 75-90 t/ha. Leguminous and grain crops are planted on 135 million hectares of land on Earth.

Among legumes, mung bean ranks second in the world in terms of the area under cultivation (about 25 million hectares) after soybeans (the world's soybean area is about 74 million hectares), and chickpeas are in third place (about 10 million hectares in the world). In the republics of Central Asia and the Caucasus, mung bean is widely used in the food industry.

When flour made from mung bean is added to pasta, its nutritional value increases even more.

Mung bean belongs to the group of legumes, and its grain contains a large amount of 24-28% oxalic acid. In addition to the food industry, it can also be used to grow nutritious fodder for livestock.

Also, nodular bacteria develop in the roots of mung bean, which absorb free nitrogen and increase soil fertility. Scientific sources indicate that mung bean is a crop that accumulates 50-100 kg of biological nitrogen and organic matter in the soil during the growing season, increasing the natural fertility of the land and providing a healing grain rich in protein and vitamins.The origin of mung bean is associated with India. Currently, mung bean is cultivated in many countries.

For example, it is cultivated on large areas in Uzbekistan, Turkmenistan, Azerbaijan, Georgia, China, Korea, Japan, India, Pakistan, Egypt, Ethiopia and other countries. According to information received from the Ministry of Agriculture, mung bean is cultivated in more than 23-27 thousand hectares of land as a repeated crop in our Republic every year. Pobeda-104, Radost, Navruz, Kahrabo, Durdona and other varieties of mung bean are cultivated in our Republic.

Among agricultural crops, mung bean (Vigna radiata) is one of the legumes that is distinguished by its high nutritional value and short growing season. Consistent measures are being taken in our country to increase the volume of mung bean cultivation and turn it into an export-oriented product. In this regard, one of the urgent issues is the scientific improvement of the agrotechnology of mung bean cultivation, in particular, its fertilization system. The correct selection of the norms and proportions of mineral fertilizers (nitrogen, phosphorus, potassium) necessary for the growth and development of plants significantly affects not only yield, but also product quality.

Since the need for nutrients in each phenological stage of the mung bean plant is different, there is a need to develop a fertilization strategy appropriate for each period.This article aims to study the effect of mineral fertilizer rates and ratios during the development of mung bean plants, determine optimal fertilization methods, and develop practical recommendations. In recent years, rational use of land resources, increasing productivity, and maintaining soil fertility have become urgent tasks.

Mung beans, which have the property of biological nitrogen fixation among legumes, are of great importance in improving soil structure, effectively organizing crop rotation systems and ensuring food security. At the same time, the development of a scientifically based fertilization system to ensure high mung bean yields is still relevant.

Studies show that the need for nutrients in plants changes at each stage of development. For example, during the vegetative growth period, the demand for nitrogen is high, while during the flowering and fruiting stages, phosphorus and potassium elements are important. Therefore, determining the appropriate mineral fertilizer rates for each stage not only supports plant physiology, but also serves to prevent excessive salinization of the soil and environmental problems.

Therefore, determining the optimal rates and ratios of mineral fertilizers at each phenological stage of the mung bean plant, thereby increasing the overall growth rate, yield and quality of the crop, is the main focus of this scientific article. The results obtained from our studies (Table 1) also confirmed this pattern.

In conclusion, the results of the conducted research showed that the need for mineral fertilizers at each stage of development of the mung bean plant is different, and the correct selection of fertilizer rates and ratios directly affects the healthy growth of the plant, effective flowering and high yield.

It was found that the use of nitrogen fertilizers is especially effective during the vegetative growth stage, and phosphorus and potassium fertilizers during the flowering and fruiting periods. Also, when optimal fertilizer rates are determined taking into account agro-ecological conditions, not only does the yield increase, but also soil fertility is maintained and excessive fertilizer consumption is prevented. This is also economically beneficial and serves to ensure environmental sustainability.

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