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ПЛОДОРОДИЕ ПОЧВЫ И ПОВТОРНЫЕ КУЛЬТУРЫ.
SOIL FERTILITY AND REPEATING CROPS.

Аннотация: В статье представлена информация о почвенно-климатических условиях Республики Узбекистан для получения двух урожаев зерна в год с орошаемых земель и получения питательных кормов для животноводства, а также о том, как посев повторных культур после озимой пшеницы создает благоприятные условия для повышения плодородия почвы.

Ключевые слова: бобовые культуры, продуктивность, маш, соя, корневые и пожнивные остатки, озимая пшеница, валовой азот, кукуруза.

Abstract: The article provides information on the soil and climatic conditions of the Republic of Uzbekistan for obtaining two grain harvests per year from irrigated lands and obtaining nutritious fodder for livestock, as well as on how planting repeated crops after winter wheat creates favorable conditions for increasing soil fertility.

Keywords: leguminous crops, productivity, mung bean, soybean, root and stubble residues, winter wheat, gross nitrogen, corn.

For the efficient use of irrigated lands, it is necessary to develop and introduce into production agricultural techniques for sowing repeated grain, fodder, oilseeds, and other crops.

Planting leguminous crops as a repeated crop is important, as these plants solve the problems of grain, protein, and oil. In addition, high annual temperatures in the republic, the use of intensive tillage methods in the cultivation of agricultural crops, as well as the cultivation of agricultural crops under irrigated conditions, lead to a rapid decrease in the accumulated natural reserves of humus in the soil.

As a result, the biological properties of the soil deteriorate, the number of microorganisms causing bacterial and fungal diseases increases, and crop yields decrease. The role of alfalfa in maintaining and increasing soil fertility, obtaining high crop yields, and effectively crop rotation is immeasurable. However, the cultivated area of alfalfa has sharply decreased in recent years.

Therefore, the introduction of intermediate, repeated grain, and leguminous crops into crop rotation systems serves to preserve and increase soil fertility. Therefore, in the conditions of meadow-sodic soils of the Fergana region, we conducted field experiments to study the yield of repeated crops (corn, mung bean, beans, and soybeans) and the effectiveness of fertilizer rates for winter wheat sown after them.

In our studies, the nutrient units and digestible protein content in the grain and green mass of repeated crops (corn) and hay (mung bean, beans, soybeans) were determined. On average, over 3 years, the grain yield of corn (38.2 c/ha) amounted to 5042.2 kg/ha, the stem (307.3 c/ha) - 4837.3 kg/ha, a total of 9879.5 kg/ha of feed units, and the protein content was 636.4 g/ha, respectively, 297.5 and 338.9 kg/ha.


In mung bean grain (15.2 c/ha) 1991,1 kg/ha, hay (32.2 c/ha) 1032,3 kg/ha total - 3023,4 kg/ha of feed units and 443,8 kg/ha and 89,8 kg/ha total - 533,6 kg/ha of protein were determined.

It should be noted that during the growing season, corn absorbs 200-250 kg/ha of nitrogen from the soil, which is probably why the amount of nutrient units and digestible protein in its grain and stems is higher than in mung beans by 6856.1 kg/ha and 102.8 kg/ha, respectively. This indicates that corn is a nutritious feed for livestock.

The amount of digestible protein in bean grain (12.3 c/ha) was 1611.2 kg/ha, in hay (12.3 c/ha) 393.4 kg/ha, and respectively 357.9 kg/ha and 39.3 kg/ha. It should be noted that among repeated crops, beans were distinguished by low yields and low nutritional units and protein content.


It was established that the soybean grain (23.3 c/ha) contains 3078.4 kg/ha, and the hay (33.5 c/ha) contains 1071.6 kg/ha, a total of 4150.0 kg/ha of feed units,

and, respectively, 687.2 kg/ha and 93.5 kg/ha - a total of 780.7 kg/ha of digestible protein.

In our research, when studying the amount of stubble and root residues in the soil of repeated crops sown for 3 years, it was established that after corn, an average of 17.2 c/ha of stubble and 35.0 c/ha of root residues (total 52.2 c/ha) accumulate in the 0-50 cm soil layer. This indicator is the highest among the studied repeated crops.

It was established that the mung bean plant can leave an average of 11.8 c/ha of stubble and 29.8 and 3.9 c/ha of root residues (total 45.5 c/ha) in the 0-30 and 30-50 cm soil layers, respectively, over 3 years.

Relatively lower indicators were obtained for bean plant residues and amounted to 8.9; 21.5 (0-30 cm) and 2.5 c/ha (30-50 cm) respectively, totaling 32.9 c/ha. From the soybean plant, an average of 10.4 c/ha of stubble, 32.0 c/ha of roots, and a total of 42.4 c/ha of residues were observed per hectare.

When studying the accumulation of nutrients in the mass of these residues, 20.8 kg of nitrogen, 9.5 kg of phosphorus, and 12.8 kg of potassium remained after corn on one hectare of land. Meanwhile, corn plants assimilate 200-220 kg/ha of nitrogen. Therefore, it is necessary to pay attention to the fertilizer application rates for subsequent crops. But growing a large amount of corn fodder for livestock was described in the previous section.

Conclusion - Soil fertility is one of the fundamental factors ensuring the sustainability and productivity of agriculture. Effective use of soil resources and preservation of their natural potential are closely linked to the practice of cultivating repeated (secondary) crops. The introduction of such crops plays a significant role in improving the physical, chemical, and biological properties of soils, restoring soil structure, and increasing the reserves of organic matter.

Research shows that properly selected secondary crops enhance the availability of essential nutrients such as nitrogen, phosphorus, and potassium,

stabilize nutrient cycles within crop rotations, and stimulate soil microbiological activity. In regions with intensive grain–cotton systems, the repeated cultivation of legumes, green manure (sideral) crops, and vegetable crops contributes to faster recovery of soil fertility, increased structural stability, and reduced ecological pressure on farmlands.

The efficient use of secondary crops also leads to more rational water and fertilizer use, ultimately increasing both the quantity and quality of agricultural production. Moreover, it helps prevent long-term declines in soil fertility. Therefore, repeated cropping is recognized as an integral component of modern agricultural technologies and one of the most effective agroecological methods for maintaining and enhancing soil productivity.

REFERENCES:

1. Авлиёқулов А.Э., Беспалов Н.Ф., Ачилдиев Р.А. и др.. “Агротехника получения высоких урожаев кукурузы на поливных землях Узбекистана”, Ташкент: Ёш гвардия, 1974 с. 1-41

2. Абдуллаев М., Назаров М. “Кузги буғдой илдиз тизимининг ривожланишига кўчатлар сони ва ўғитлар меъёрини таъсири”. “Ўзбекистон Республикаси қ/х.да сув ва ресурс тежовчи агротехнологиялар, Ташкент, 2008, 273-275 бетлар

3. Г.Урунбаева, О.Муминова. “Soil fertility”. Novateur Publication’s Journal a multidisciplinary Peer Reviewed journal, 2020 № 6-сон