

**IMPACT OF CROPS INTERCULTIVATION ON GREEN MASS QUALITY AND SOIL
PRODUCTIVITY**

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Annotation: In the conditions of a market economy, the integrated and sustainable development of agriculture, in particular the farming and livestock sectors, is one of the urgent tasks in the independent Republic of Uzbekistan. Creating a solid and effective feed base is of great importance in providing the population with high-quality food products, increasing the volume of livestock production and reducing their cost.

Keywords: Crops, forage, crop rotation, green mass, soil fertility, intercropping.

Annotatsiya: Bozor iqtisodiyoti sharoitida mustaqil O'zbekiston Respublikasida qishloq xo'jaligini, xususan, dehqonchilik va chorvachilik tarmoqlarini uzviy va barqaror rivojlantirish dolzarb vazifalardan biri hisoblanadi. Aholini sifatli oziq-ovqat mahsulotlari bilan ta'minlash, chorvachilik mahsulotlari ishlab chiqarish hajmini oshirish hamda ularning tannarxini kamaytirishda mustahkam va samarali ozuqa bazasini yaratish muhim ahamiyat kasb etadi.

Kalit so'zlar: Ekin, yem-xashak, almashlab ekish, ko'k massa, tuproq unumdorligi, qo'shib ekish.

The productivity, healthy development and full manifestation of the genetic potential of livestock largely depend on the provision of the diet with juicy, high-protein and biologically complete forage. From this point of view, the main goal of this discipline is to equip bachelor-level specialists with the knowledge of farming, crop rotation systems, the correct organization of natural hayfields and pastures, the cultivation of fodder crops, and the continuous provision of livestock with feed throughout the year.

The basis of the technology for growing fodder crops for livestock is field fodder crops, natural pastures, and hayfield plants. However, in order to strengthen the feed base in modern livestock farming, along with traditional fodder plants, the possibilities of rational use of algae, fungi, microbiological products, industrial and agricultural waste are also expanding. This requires a comprehensive and efficient use of feed resources.

Within the framework of this science, the botanical description, biological and ecological properties of field and meadow forage plants, agrotechnologies for their cultivation in crop rotation systems, as well as methods for the preparation, storage and rational use of high-quality forage products from these crops are studied in depth. This knowledge serves to reduce the cost of forage in livestock farming, increase the quality and efficiency of feed.

After the independence of the Central Asian countries, including the Republic of Uzbekistan, fundamental structural changes were made in the agricultural system. The reform of land relations, the privatization of livestock, the development of farmer, dehqan and other forms of farming created broad opportunities for the further development of livestock farming. At the same time, forage production remains relevant as one of the largest, most diverse and complex sectors of agriculture.

Ensuring scientific and technical progress in the field of fodder production should be carried out in the following priority areas:

- development and implementation of scientifically based fodder production systems that can fully satisfy the feed needs of livestock in each farm;

- improving the quality of fodder, rational use of resources and reducing material costs;
- directly linking the incentives for the work of fodder producers with the quality and quantity of the fodder produced;
- creating a modern and affordable infrastructure for storing high-quality fodder;
- introducing improved, innovative technologies for the preparation, storage, processing and use of fodder into production.

Based on the above, a deep scientific study of the issues of growing fodder crops, crop rotation systems and the effective use of natural pastures is an important factor in the sustainable development of modern agriculture and animal husbandry and determines the relevance of the topic of this dissertation.

Increasing the volume of livestock production in Uzbekistan and improving their quality indicators is one of the priority areas of state agrarian policy. The effective implementation of this task is, first of all, closely related to the formation of a stable and sufficient feed base for animal husbandry. This issue is emphasized in the Strategy of the President of the Republic of Uzbekistan "Uzbekistan-2030", as well as in a number of decrees and resolutions aimed at the development of agriculture.

In recent years, the organization and development of multidisciplinary farms has expanded the possibilities of integrating animal husbandry with agriculture. As a result, great attention is being paid at the state level to strengthening the feed base and introducing scientifically based feed production systems. In particular, the cultivation, preparation, storage, processing and rational use of food crops are recognized as the main factors in increasing livestock productivity.

The main sources of feed for livestock are forage plants grown in fields and natural pastures, which account for about 95% of the total feed balance. In addition, field crop residues (straw, stubble), waste from the processing of grain and technical crops, as well as products of microbiology and the chemical industry, feed yeasts, amino acids, vitamins, enzymes and other biologically active substances play an important role in enriching feed rations and increasing their nutritional value. This approach is fully consistent with the principle of "scientifically based feed rations".

Nevertheless, the current level of productivity of forage crops grown on arable land of Uzbek livestock farms does not fully meet the needs of livestock in high-quality feed. One of the main reasons for this is the insufficient improvement of technologies for growing fodder crops, as well as the fact that the qualifications of specialists working in this field do not fully meet modern requirements. This situation is noted as a significant problem in state programs aimed at modernizing agriculture.

Directions for intensification of fodder cultivation in fields

Intensification of fodder cultivation in fields should be carried out in the following main directions:

1. Improving the structure of arable land, i.e. selecting high-yielding and highly nutritious crop types and varieties suitable for certain soil and climatic conditions, replacing low-yielding crops with high-yielding crops;
2. Increasing the productivity of nutritious crops based on the introduction of intensive agrotechnologies;
3. Increasing gross fodder production through the effective use of land and water resources through the use of repeated, intercropping and mixed crops.

According to scientific research, with the optimization of the structure of arable land and the use of proper agricultural techniques, the productivity of cereals and cereal-legume crops can increase by up to 1.8 times, silage crops by 2.5-3.0 times, and annual grasses by 2.0-2.7 times. In

particular, expanding the area of perennial legumes such as alfalfa is of strategic importance in terms of maintaining soil fertility and enriching it with biological nitrogen.

Grain crops occupy a special place in the feed balance. They are concentrated feed, containing a high amount of protein, easily digestible carbohydrates and minerals. Therefore, increasing grain production is an important factor in increasing livestock productivity.

In connection with the task of achieving grain independence in Uzbekistan, the introduction of repeated crops after winter wheat crops will allow for the effective use of the soil and climatic conditions of the republic and a sharp increase in fodder production. This approach fully complies with the goals of resource-efficient and intensive agricultural development set out in the "Uzbekistan-2030" strategy.

In terms of effective use of pastures and meadows, pastures and meadows are the cheapest and most nutritious source of feed for livestock. In Central Asian conditions, pastures account for 70-97% of agricultural land, but only 30% of the total feed balance is taken from this account. The main reason for this is the low productivity of natural fodder areas, irregular use of pastures and their insufficient care.

Scientific and practical experiments show that:

- Surface improvement of pastures can increase productivity by 2-3 times,
- Fundamental improvement by 4-6 times,
- Creation of irrigated pastures by up to 10 times.

This shows that the scientific organization of pasture use is a decisive factor in strengthening the feed base of livestock.

In terms of improving feed preparation and storage technologies, reducing the loss of nutrients in feeds prepared for the winter period is of particular importance. Due to the imperfection of current technologies, 40-50% of nutrients are lost in hay, and 30-35% in silage. Therefore, the introduction of progressive conservation and storage technologies is an important task.

The preparation of hay, the production of artificially dried vitamin grass meal, and full-ration mixed feeds allow achieving high efficiency in livestock farming. In particular, the use of balanced mixed feeds provides a 30-35% higher economic efficiency than direct feeding of grain. The above scientific evidence shows that the issue of creating a solid feed base for livestock is a multifaceted and complex problem, which can be solved only through a scientifically based, integrated approach. This clearly demonstrates the relevance of this research, its inextricable link with the state agrarian policy and the "Uzbekistan-2030" strategy.

The Resolution of the President of the Republic of Uzbekistan No. PQ-2640 dated October 24, 2016 "On the protection of agricultural plants from pests, diseases and weeds", the Strategy of Actions on five priority areas of the development of the Republic of Uzbekistan for 2017-2021, approved in accordance with the Decree No. PF-4947 dated February 7, 2017 "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan", the Resolution No. PQ-3281 dated September 15, 2017 "On measures for the rational placement of agricultural crops and the volume of agricultural production for the 2018 harvest", the Resolution of the Cabinet of Ministers No. 25 dated January 14, 2018 "On the Farmer This dissertation research contributes to the implementation of the tasks set out in the Resolution of the Government of the Republic of Uzbekistan "On measures to improve the efficiency of land use and additional income generation of farms" and other regulatory legal acts.

Level of study. The issues of fodder cultivation and the formation of a feed base for livestock have long been of practical and scientific interest in the territory of Central Asia. Historical sources testify that the initial scientific and empirical views on the use of fodder plants and the assessment of pastures in this region were formed long before the Russian and European scientific schools. The work "Boburnoma" by the great thinker and statesman Zahiriddin

Muhammad Babur describes the flora and fauna of Central Asia, Afghanistan and India, in particular the suitability of pastures and meadows for livestock, based on scientific observations. The author draws clear conclusions about the morphological characteristics of grasses in certain regions, their nutritional value and suitability for livestock species. This situation indicates that the differential and ecological approach to the issues of fodder cultivation has historical roots.

The scientific development of fodder cultivation in Uzbekistan has taken a systematic form since the second half of the 20th century. In this process, scientific research by scientists from the Uzbek Research Institute of Animal Husbandry, the Uzbek Research Institute of Karakul Breeding, the Galla-Arol Grain Scientific and Production Association, the Institute of Botany of the Academy of Sciences of Uzbekistan, and higher educational institutions of the republican agricultural sector played an important role. Fundamental and applied research was conducted in these scientific institutions aimed at developing fodder cultivation in accordance with regional soil and climatic conditions.

Scientific research mainly covered the following priority areas: identification of nutritious plant species adapted to growth in different natural and climatic zones, introduction of promising species with high nutritional value and introduction into production; improvement of agrotechnologies for growing fodder crops in irrigated, dry, desert and hilly conditions; search for ways to solve the problem of protein deficiency in livestock farming; selection and seed production of fodder crops; development of modern technologies for the preparation, conservation and storage of fodder.

Also, the study of diseases, pests and weeds in fodder crops is one of the important scientific areas, and significant research has been carried out in this area by a number of scientists. In particular, the works of V.A. Burigin, F. Dzhangurazov, P.A. Gomolitsky on the study of diseases of fodder crops and their biological characteristics served as an important scientific basis. In developing agrotechnical control measures against them, the scientific research of scientists such as B.Sobirov, V.Kondratyuk, Z.Nasirov, A.Jurakulov, Z.Tursunkhodjayev, M.Muhammadjonov, Q.Mirzajonov, B.Bakhromov, F.Khasanova, R.Ruzimetov is of particular importance. In the direction of improving chemical control methods, the research of B.Aleev, M.Lofovatskaya, R.Tillaev, A. Sagdullaev, N.Khalilov, Y.A.Buriyev, B.Kholmanov, M.Shodmanov, A.Yuldashev, N.Turdiyeva, S.Sulliyeva, Sh.Rizayev, U.Charshanbiyev is noteworthy.

Although the above scientific developments have served as an important scientific basis for the development of the theory and practice of forage production, in the current era of market economy, climate change and increasing demands for efficient use of land resources, there remains a need to further deepen research in this area based on complex, innovative and resource-saving approaches.

Scientific research methods in agriculture. Field experiments are the main method of studying various issues in agriculture. The main tasks of field experiments are to provide a comparative scientific, agrotechnical and economic assessment of new methods or crop care technologies being studied for introduction into production in various natural and economic conditions, using the results of laboratory, vegetation, lysimeter and small-scale studies.

The following observation methods are widely used in agriculture.

1. Laboratory
2. Vegetative
3. Lysimetric
4. Vegetative-field
5. Field experiments

Through these observation methods, observations are carried out on agricultural plants, data are obtained, and recommendations are given based on the data for the farm and specific conditions in which the observation was made.

Stages of scientific research. Scientific research is carried out sequentially in a certain order. Accordingly, the research consists of several stages, which are as follows:

- Correct selection of the topic based on the scientific idea;
- Drawing up a scientific program;
- Conducting experiments based on the program;
- Developing conclusions and recommendations based on the results of the experiment;
- Introducing scientific developments into production.

The scientific topic should be aimed at solving current problems, taking into account real opportunities, based on the requirements of the time.

Novelty of scientific work. In 2024-2025, it was found that the amount of green biomass increased in the intercropping crops compared to the experimental crops. It was found that the mung bean plant produced higher biomass than the control from the intercropping crops.

General conclusion. Within the framework of this dissertation, the impact of the intercropping system on the yield and quality of green mass and soil fertility was studied in a comprehensive scientific, theoretical and practical way. The results of the study showed that intercropping is an important factor not only in increasing the volume of forage production, but also in improving the agrobiological condition of the soil, efficient use of resources and the formation of a sustainable farming system.

It was found that as a result of intercropping legumes and cereals or technical crops, the yield of green mass increases significantly compared to monoculture crops. In this case, the increase in yield is explained by the biological compatibility between crops, the complementary use of light, moisture and nutrients. In particular, intercropping options based on corn-legumes, cereal-legumes, and perennial grasses have significantly improved the protein content, digestibility, and feed unit values of green mass. This allows for the formation of a high-quality and nutritious feed base for livestock.

Studies have confirmed that intercropping has a positive effect on soil fertility. In agrophytocenoses with legumes, biological nitrogen accumulation increases, the total and assimilable nitrogen content of the soil increases, and the humus balance is stabilized. Intercropping also improves the physical properties of the soil, strengthens its structure, reduces compaction, and optimizes the water-air regime. As a result, the risk of soil erosion decreases and the ecological stability of the agroecosystem increases. The results of the dissertation show that intercropping allows to reduce the need for mineral fertilizers to a certain extent and reduce production costs. This serves to reduce the cost of agricultural products in a market economy and increase the economic efficiency of farms. These aspects are fully consistent with the state strategies of the Republic of Uzbekistan aimed at developing agriculture, in particular the "Uzbekistan-2030" strategy and the priority areas of sustainable development in the agricultural sector. In general, the obtained scientific conclusions indicate that the intercropping system has significant theoretical and practical significance for the widespread introduction of intercropping in various soil and climatic conditions of the republic, increasing the efficiency of forage production, maintaining and increasing soil fertility, and creating a solid feed base for livestock. The results of the research will serve as a scientific basis for the development of resource-saving, environmentally friendly and highly efficient farming technologies in the future.

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