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STUDY OF THE IMPACT OF NUTRITIONAL METHODS DURING THE VEGETATION PERIOD OF COTTON PLANT ON YIELD

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ABSTRACT

This article analyzes the main trends in the development of world cotton growing and the distribution of cotton production by major countries. It is highlighted that high yields and fiber quality in cotton growing depend on the timely and effective application of agrotechnical measures. The study studied the growth, development, yield and disease resistance of the foreign cotton variety "Xin Lu Zao-57" in the conditions of the Bukhara region. Also, the impact of various feeding methods and standards on the growing season of the crop, the specifics of soil and climatic conditions, economic efficiency and recommendations for production were analyzed. The results showed that the use of foreign varieties creates the opportunity to obtain high yields in cotton growing and the importance of modern agrotechnology.

Keywords: Cotton growing, cotton varieties, yield, agrotechnology, feeding methods, “Xin Lu Zao-57”, Bukhara region, soil and climatic conditions, economic efficiency.

G‘O‘ZA O‘SIMLIGINING VEGETATSIYA DAVRIDA OZIQLANTIRISH USULLARINI HOSILDORLIKKA TASIRINI O‘RGANISH

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ANNOTATSIYA

Mazkur maqolada jahon paxtachiligi rivojlanishidagi asosiy tendensiyalar va paxta yetishtirish hajmining yirik davlatlar bo‘yicha taqsimlanishi tahlil qilingan. Paxtachilikda yuqori hosildorlik va tola sifati agrotexnologik tadbirlarning o‘z vaqtida va samarali qo‘llanilishiga bog‘liqligi yoritilgan. Tadqiqotda Buxoro viloyati sharoitida xorijiy “Xin Lu Zao-57” g‘o‘za navining o‘sishi, rivojlanishi, hosildorligi hamda kasalliklarga bardoshliligi o‘rganildi. Shuningdek, turli oziqlantirish usullari va me’yorlarining ekinning vegetatsiya davriga ta’siri, tuproq-iqlim sharoitlarining o‘ziga xos jihatlari, iqtisodiy samaradorligi va ishlab chiqarishga tavsiyalari tahlil qilindi. Natijalar xorijiy navlarning qo‘llanilishi

paxtachilikda yuqori hosil olish imkoniyatini yaratishi hamda zamonaviy agrotexnologiyalarning ahamiyatini ko‘rsatib berdi.

Kalit so‘zlar: paxtachilik, g‘o‘za navlari, hosildorlik, agrotexnologiya, oziqlantirish usullari, “Xin Lu Zao-57”, Buxoro viloyati, tuproq-iqlim sharoiti, iqtisodiy samaradorlik.

INTRODUCTION

Today, the bulk of the world's cotton production is accounted for by 5 countries: China, the USA, India, Pakistan and Uzbekistan. According to the International Cotton Advisory Committee (ICAC), in recent years, the world's cotton production has reached 23 million tons, an increase of 4% compared to the annual rate1. In cotton-growing regions abroad, the effective use of irrigation water and mineral fertilizers in the agro-technological system for the creation and cultivation of cotton varieties with high ripening, high yield, high fiber yield and quality, and resistance to diseases and pests is considered relevant.

Cotton is grown in 84 countries around the world, including 20 in North and South America, 28 in Asia and Oceania, 31 in Africa, 3 in Europe, and Australia. If 20 years ago, 17 million tons of cotton fiber were grown worldwide, now this figure is about 25 million tons. Over the past period, cotton fiber production in the United States has increased by 35%. In China, Pakistan, Brazil, and India, this figure has increased by 1.5–3 times. In many countries, such as the United States, Pakistan, Brazil, and Australia, the volume of cotton fiber production varies depending on internal and external conditions, and often on the needs of the world market. This is sometimes affected by weather conditions, the incidence of plant diseases, and other reasons. Today, the United States is the world's leading producer of cotton fiber. The United States sells 80 percent of the cotton fiber produced in the country. This represents 41.3 percent of the fiber sold in the world market. India is the second largest producer of fiber in the world, selling 12.6 percent of the cotton fiber produced.

In the world cotton growing, the development of optimal norms of irrigation and mineral fertilizers in agrotechnical measures for cotton cultivation creates the opportunity to optimize soil moisture and increase the coefficient of fertilizer utilization by the plant. The long-term stable cultivation of cotton varieties in cotton growing is directly dependent on the agrotechnical processes used. As a result of the full satisfaction of the physiological needs of the plant for irrigation water and nutrients during the growing season, large bolls and high technological quality indicators of the fiber are achieved.

In accordance with the resolution of the President of the Republic of Uzbekistan dated December 15, 2023, in 2024, 10 percent of cotton fields were sown with foreign seeds. In 2025, about 100 thousand hectares of land were sown with varieties imported from abroad as an experiment. The Chinese, who came to our country many years ago and learned from the experience, are now harvesting 70-80 centners per hectare. In our country, the average yield is 30-32 centners. Some farmers reach 40 centners. The low yield in our districts of the Bukhara region engaged in cotton cultivation is due to a sharp increase in temperature in the summer months, a decrease in water resources, as well as a number of problems in the use of agrotechnologies, especially in feeding plants with mineral and local fertilizers during the growing season.

Farmer and cotton textile clusters need a scientific and practical approach to achieve high efficiency and maximum income from cotton cultivation.

If agrotechnical measures are not carried out on time and in the prescribed manner during the growing season of cotton plants, we will not be able to achieve high yields. According to Chinese agrotechnology, the number of seedlings per hectare is 2-3 times higher than ours, and fertilizer is prepared using stimulants. This is a very modern method.

Field production experiments were conducted on March 30, 2025, in the conditions of widespread irrigated meadow soils at the educational experimental farm of the Faculty of Natural Sciences and Agrobiotechnology of Bukhara State University, located in the Bukhara district of Bukhara region, based on the methodology of conducting field experiments by B.A. Dospekhov.

The purpose of the study is to determine the The aim is to select a variety suitable for the soil and climatic conditions of the Bukhara region, and to provide recommendations for improving some elements of feeding technology in various ways when grown as a perennial crop.

Research objectives consists of:

In the conditions of Bukhara region, cotton cultivation is also possible in the near future.

determine optimal feeding methods for obtaining high and quality cotton yields;

To determine the effect of growing cotton as the main crop and using optimal feeding methods and standards during the growing season on plant growth, development, productivity, and yield;

Determining the economic efficiency of growing cotton as a main crop and under growing periods, optimal feeding methods and standards;

Provide recommendations for the production of cotton as a main crop and optimal feeding methods and standards during growth periods.

Object of researchA foreign cotton variety (XIN LU ZAO-57) is planted as the main crop and feeding methods (root and foliar feeding) are adopted during the growing season.

"Xin Lu Zao-57" Vegetation period The maturity period is 115-120 days. It is 70-80 s/ha. As for disease resistance, it is resistant to fusarium and verticillium wilt viral diseases, while the fiber yield is 45.4%, fiber length 1.26 inches (32mm), micron gauge 4.2-4.5 and the tensile strength of the fiber equal to 37.8 gs/tex

Research methods. The method was based on the methods in the manuals "Methodology of state variety testing of agricultural crops". Statistical analysis of the data was carried out using the computer programs "Excel 2010" and "Statistics 7.0 for Windows" based on the method of B.A. Dospechov "Methodology of field experiments".

Lithological-geomorphological characteristics of the study area Bukhara region is located in the lower reaches of the Zarafshan River, and irrigated areas are located 4–6 km wide along the river. The general relief slope of irrigated areas in the study area is 0.0015–0.0002. The irrigated zone of Bukhara region is almost generally included in the desert zone in the central

and southern subzones. Only small areas located along the north-eastern corner, in the widths of the foothill slope plain, are characterized as arid regions.

The soils of the Bukhara region are mainly composed of irrigated meadow, meadow-boggy, and meadow-saline soils. According to their mechanical composition, the soils are mainly (~80%) heavy in mechanical composition, with a bulk density of 1.35–1.6, and a porosity index of 39–50%.

Bukhara district is located in the subtropical desert region, its territory consists of flat relief, uneven low-high, wavy plains in the direction of the Kyzylkum sands from the south-east. The central part of these plains consists of alluvial deposits, and from a geomorphological point of view, the land area of Bukhara district is located on the plain of the middle part of the Zarafshan River delta. The soil-forming parent rocks in the region are proluvial, alluvial, loess-like sands and loess, and the structure contains mixed layers of alluvial rocks with varying degrees of salinity, various colors and gravelly rocks. In the desert region of the region, steppe and meadow-steppe soils are widespread, and in their deep layers there are humus-rich sedimentary deposits of the Quaternary period.

The territory of Bukhara district is lithologically and geomorphologically composed of various rocks belonging to different geological periods, and the soil-forming parent rocks are alluvial rocks to a small (weak) extent. In the south-west and south-east of the region, soft-rock deposits mixed with gravel-sand and soil are located, and in some places alluvial deposits cover the surface of these layers. In the main part of the region, loams with clay, sandy and sandy layers on top of the soil-forming parent rocks, and sand-mixed layers of alluvial deposits are distributed.

In general, various types of soil cover are found in the Bukhara district, which is directly related to the location of the territory in a relatively low-lying area, the complex structure of the earth's surface, the diversity of soil-forming rocks, specific natural and climatic conditions, the uniqueness of the plant world, as well as the influence of anthropogenic factors.

At this point, it is appropriate to briefly touch upon the history of the study of the soil cover of the Bukhara oasis. The initial studies, carried out by Dimo NA in the description of the route-expedition, studied the soils of the Zarafshan River valley [Dimo, 1915; pp. 365–397]. Also, the studies carried out by Orlov MA described the soils of the Bukhara oasis in relatively detail. In particular, maps of the physical and chemical structure of the soil cover were compiled based on the results of soil composition analysis in laboratory conditions, and scientific conclusions were drawn about the origin of the soils [Orlov, 1934; pp. 54–248; Orlov, 1937; pp. 22–28].

The soils of the irrigated lands distributed in this region were studied by Kimberg NV and studies were carried out to describe the soils of the region, clarify the genesis of the soils, and divide the soil-melioration areas. Based on the analysis of the results, appropriate soil maps were developed and the laws of the formation and development of the soil cover were shown. In particular, Kimberg NV divided the irrigated meadow soils distributed in the Bukhara oasis into such types as swampy-meadow soils, newly irrigated meadow soils, and irrigated meadow soils [Kimberg, 1957; pp. 538–548; Kimberg, 1984; pp. 3–288].

Climatic conditions of the research object. The climate of the region is arid, with hot summers and hot winds (garmsels). The average annual air temperature is +14.2...+18°C, with the hottest month in summer being July with an average of +28.3...+29.6°C, and the coldest month is January (1.5...–0.4°C). The average annual air temperature during the growing season is around 22.8–24.4°C. The period without significant frosts in the region is on average 212–214 days, and this period lasts from March 26–31 to October 22–25.

The average annual precipitation in the region is 205–114 mm, falling mainly in the winter-spring season. The average monthly humidity in the Bukhara oasis is around 51–53% throughout the year, and in the summer it averages 17–25%.

Relatively dry air and high air temperatures cause significant evaporation. The average annual evaporation value of the water surface in this region is ~1752–2117 mm. The main evaporation of moisture is observed during the growing season (the evaporation value during this period was determined to be 1412–1708 mm). It is important to maintain soil moisture during this period.

Thus, the desert-continental climate is strongly expressed in the Bukhara oasis, characterized by high air temperatures, low precipitation, strong winds and high evaporation rates, dry air, and ultimately increased secondary salinization of soils and deterioration of their general condition.

The following phenological observations, biometric measurements, calculations and analyses are carried out in field experiments:.

-The vegetation period, yield, and field germination of the foreign cotton variety "Xin Lu Zao-57" are studied. After the seeds are sown in the field, the field germination is determined by comparing the number of seeds that have germinated with the total number of seeds planted in the field.

- When conducting phenological observations in the experiment, the time of sowing seeds in the field, the full germination of cotton plants, the appearance and formation of 2-3 true leaves, budding, flowering and fruiting, ripening, etc. are determined (BA Dospekhov's “Methodology of field experiments”).

- In the experiment, biometric measurements were taken on 10 plants in each replicate and on 10 selected plants in each replicate, for a total of 100 plants.

-Cotton harvest is harvested and determined when the cotton seed is fully ripe.

-. The economic efficiency of growing the selected variety in replicates and replants under different feeding methods and different feeding standards is determined.

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