

Comparative Analysis of Population Growth and Wheat Production in the Republic of Uzbekistan and the People's Republic of China

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Abstract: As a result of the population growth of countries around the world, including the Republic of Uzbekistan and the People's Republic of China, the demand for food products is increasing. This article presents an analysis of demographic growth and the growth of population demand for wheat grain in Uzbekistan and China based on descriptive and scientific data. In Uzbekistan, the population increased from 4.4 million to 37.8 million during 1920-2024, and in China from 527.2 million in 1950 to 1,416.333 million today. As a result, the demand for food products has increased.

After independence in 1991, wheat became the second most important crop after cotton as part of a national “Self-sufficiency” campaign in Uzbekistan. Consequently, irrigated wheat area increased significantly from 0,63 million ha in 1991 to 1,1 million ha in 2025. During this period, average yield increased from 1,34 to 79,8 causing total production to increase from 0,95 million tons to 8,7 million tons. According to the data obtained in 2023/2024, the area of wheat cultivation in the People's Republic of China was 23,627 thousand hectares, the total yield was 136,946 thousand tons, and the average yield was equal to 5.81 t/ha.

According to the data of the Scientific Research work which held at the condition of Uzbekistan the yield potential of winter wheat varieties “Sharof-100”, “Asr ilgisi”, “Khamkor”, “Baraka” in the climatic conditions of Uzbekistan is 8.5-9.0 t/ha, “Ultra”, “Grad”, “Oq yor”, “Risq”, “Qora Daryo”, “Nodir”, “Ravnaq” varieties have the possibility of yielding 10.0-10.5 t/ha. These varieties are noted as strong and valuable varieties according to technological quality indicators of grain.

Keywords: Republic of Uzbekistan, People's Republic of China, population, demographic growth, food, wheat, productivity, grain quality.

Introduction. As a result of the population growth of countries around the world, including the Republic of Uzbekistan and the People's Republic of China, the demand for food products is increasing[1]. This article presents an analysis of demographic growth and the growth of population demand for wheat grain in Uzbekistan and China based on descriptive and scientific data. In Uzbekistan, the population increased from 4.4 million to 37.8 million during 1920-2024, and in China from 527.2 million in 1950 to currently 1,416.333 million people today. As a result, the demand for food products has increased [4].

The fact that more than 60% of the world's population lives in the Asian continent and the high demographic growth indicators compared to other continents, it is observed that the demand for food, including wheat grain and products derived from it, increases [1; 3].

The global climate change observed on the earth requires agricultural specialists to introduce water-saving irrigation technologies, smart agriculture and digital innovations in the production

of wheat varieties resistant to adverse climatic conditions - drought and salinity, seeding, wheat varieties in the soil climate of each region of the world countries[2].

Discussion. Territory of Uzbekistan. Uzbekistan borders on Kirgizistan in the northeast, north and northwest - Kazakhstan; in the southwest and south - Turkmenistan; in the south - Afghanistan, and in the southeast - Tajikistan. It has access to the almost dried up Aral Sea, but is one of two countries in the world that need to cross the territory of at least two states to access the World Ocean.

The population of Uzbekistan is 37,8 million (as of March 9, 2025). The majority of the population (more than 83.7% - 28.15 million people) is Uzbek. The Uzbeks make up a particularly large proportion of the population in Andijan region. There are more than 1 million Russians, Kazakhs, Tajiks each; in addition to 500 thousand Tatars, Kyrgyz, Karakalpak, there are also Persians (200 thousand), Koreans (200 thousand), Ukrainians (150 thousand), Turkmens (150 thousand), Armenians (100 thousand), Arabs and Roma (500 thousand), etc. 51% of the population lives in cities and 49% in villages. As of 2024, the number of men is 18.9 million, and the number of women is 19.1 million. The urban population is 17.1 million, and the rural population is 20.9 million. The number of births is 413.6 thousand, and the number of deaths is 80.9 thousand. The number of registered marriages is 108.9 thousand [7].

Table 1. Population of the Republic of Uzbekistan

| Years | Population, <i>million people</i> | Percentage increase, % |
|-------|-----------------------------------|------------------------|
| 1920 | 4.4 | --- |
| 1930 | 4.9 | +11.4% |
| 1940 | 6.6 | +34.7% |
| 1950 | 6.2 | -6.1% |
| 1960 | 8.4 | +35.5% |
| 1970 | 11.8 | +40.5% |
| 1980 | 15.8 | +33.9% |
| 1990 | 20.2 | +27.8% |
| 2000 | 24.5 | +21.3% |
| 2010 | 28 | +14.3% |
| 2020 | 33.9 | +21.1% |
| 2021 | 34.5 | +1.7% |
| 2022 | 35.2 | +2.0% |
| 2023 | 36.0 | +2.2% |
| 2024 | 36.8 | +2.2% |

The majority of the population is Uzbek, who make up 84.7% of the population. Uzbekistan is a multinational republic, with representatives of about 130 nationalities and ethnic groups living there.

Like other countries in Central Asia, the population of the Republic of Uzbekistan is relatively "young", with a large proportion of it being of working age. 42% of the total population is young people before the working age, 51% is of working age, and 7% is older than the working age.

Table 2. Ethnic composition (2025 year)

| Nation | Number |
|-------------|--------------------------------|
| Uzbeks | 29 million 200 thousand people |
| Tajiks | 1 million 700 thousand people |
| Kazakhs | 821 thousand 200 people |
| Russians | 720 thousand 300 people |
| Karakalpaks | 752 thousand 700 people |
| Tatars | 187 thousand 300 people |
| Kyrgyz | 291 thousand 600 people |
| Koreans | 174 thousand 200 people |
| Turkmen | 206 thousand 200 people |
| Ukrainians | 67 thousand 900 people |
| Armenians | 34 thousand 150 people |

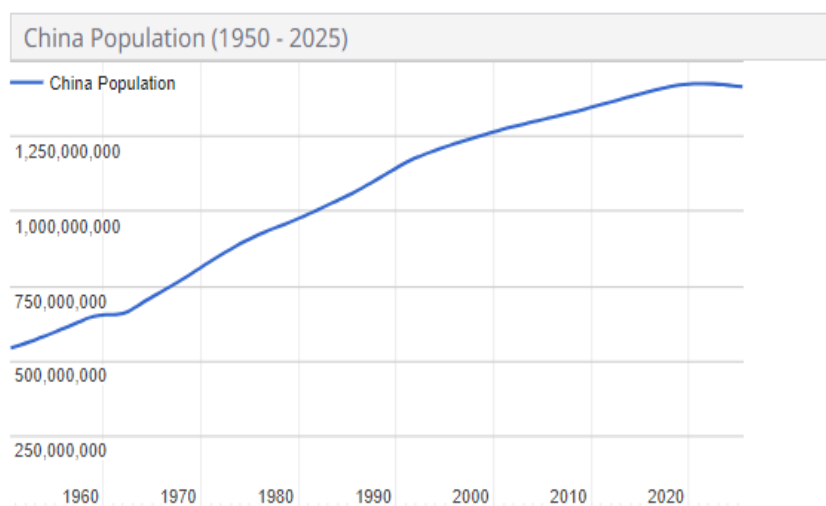
| | |
|----------------|-------------------------------------|
| Azerbaijanis | 41 thousand 200 people |
| Georgians | Around 3 thousand 800 people |
| Uyghurs | Around 20 thousand |
| Belarusians | Around 20 thousand |
| Crimean Tatars | Around 10 thousand |
| Jews | Approximately 20-30 thousand people |
| Turks | Around 10 thousand |
| Germans | 3 thousand 900 people |
| Greeks | Less than 10 thousand |

Territory of China. China is the third largest country in the world after Russia and Canada. It is surrounded by the Yellow, East China and South China Seas of the Pacific Ocean to the east. Area - 9.6 million km². Population - 1 billion 425 million people, second only to India in terms of population in the world (2024) [5].

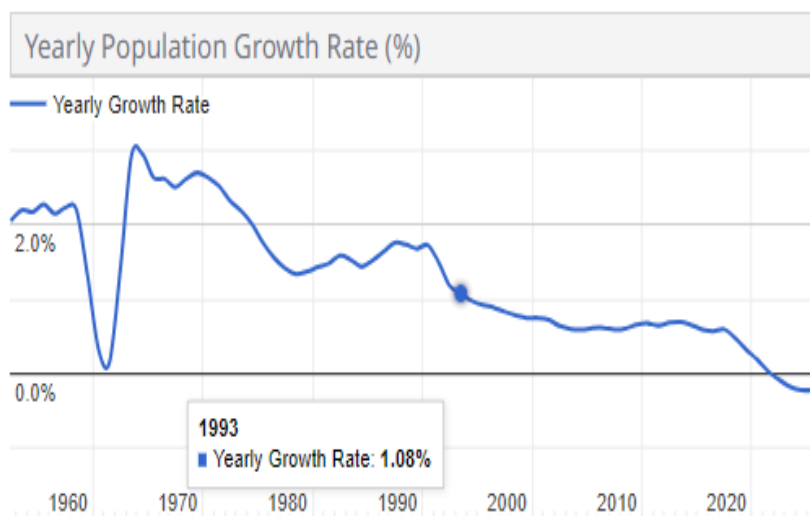
The capital is Beijing. Administratively, it is divided into 23 provinces (including Chinese Taipei), 5 autonomous regions, and 4 centrally-administered cities (Beijing, Shanghai, Tianjin, Chongqing).

China population. The current population of China is 1,416,340,126 as of Tuesday, June 3, 2025 based on Worldometer's elaboration of the latest United Nations data. China 2025 population is estimated at 1,416,096,094 people at mid-year [6].

Picture 1. China population (LIVE) - 1,416,338,493



Picture 2.

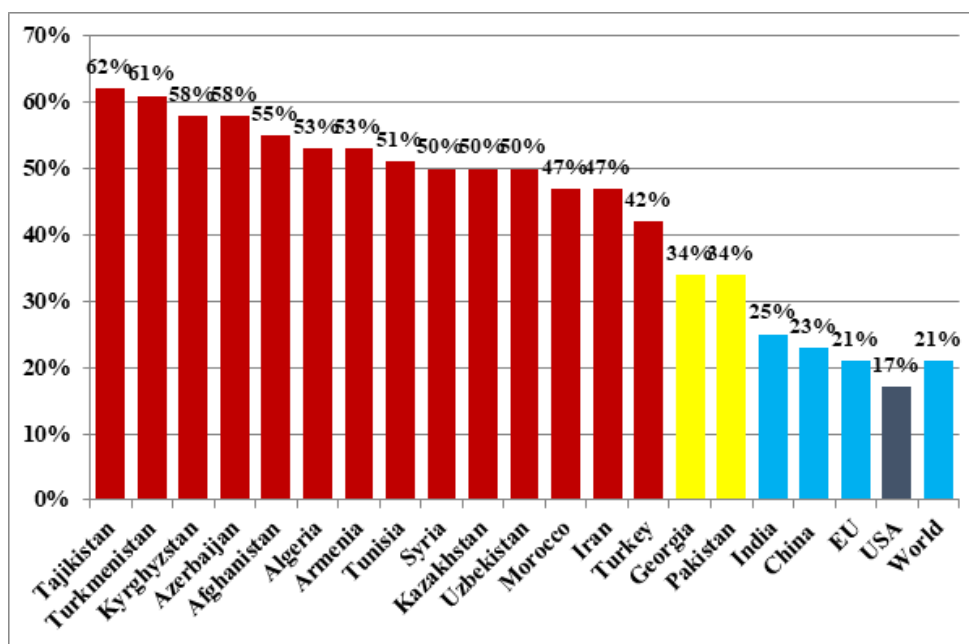


1. China population is equivalent to 17.20% of the total world population.
2. China ranks number in the list of countries (and dependencies) by population.
3. The population density in China is 151 per Km² (391 people per mi²).
4. The total land area is 9,388,211 Km² (3,624,807 sq. miles).
5. 67.55% of the population is urban (956,553,854 people in 2025)
6. The median age in China is 40.1 years.

When analyzing the above-mentioned data, it can be observed that over the past 30 years, the populations of the Republic of Uzbekistan and the People's Republic of China have steadily increased. Along with the rise in population in both countries, there has also been a growing demand for food products. According to scientific sources, the largest share of daily food consumption comes from wheat, rice, corn, and other cereal crops. Wheat, in particular, plays a crucial role as it is the most widely consumed cereal crop across the world, and it is distinguished by its large cultivation area and high total yield among grain crops [2].

As can be seen from the data presented in Figure 3, the population of many countries around the world derives a significant portion of their daily caloric intake from wheat products. Specifically, daily nutritional calories obtained from bread and other wheat flour products account for 50% in Uzbekistan and 23% in the People's Republic of China.

Picture 3. 50% OF DAILY CALORIES COME FROM WHEAT PRODUCTS

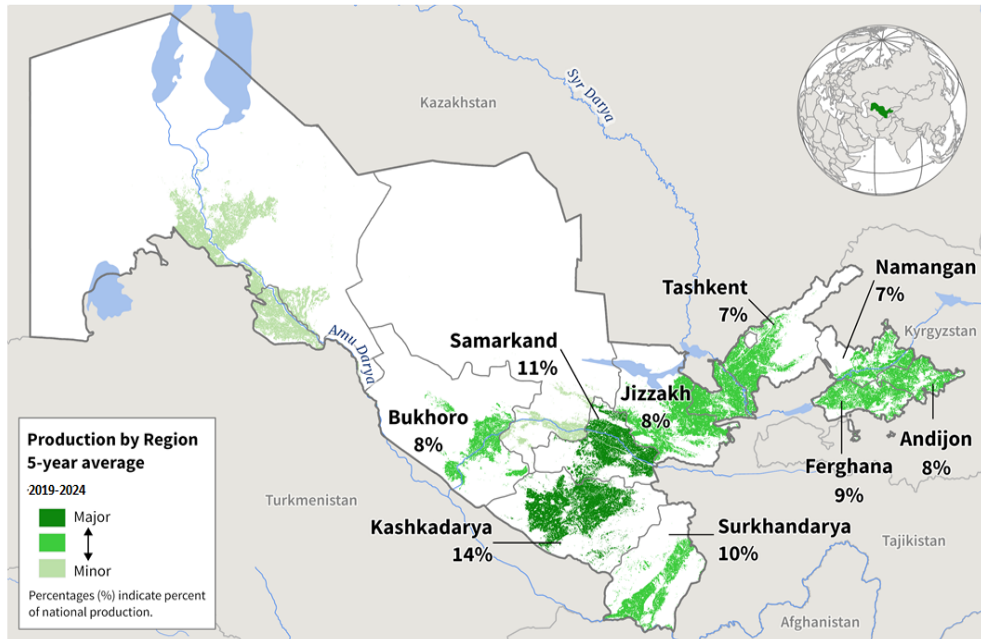


Agriculture replays an important role in the economy of Uzbekistan contributing 16%to GDP and 44% to employment. Uzbekistan has a land area of 44,8 million ha, of which about 4,5 million ha is arable, and 4 million ha is irrigated.

Main cultivated crops are cotton, wheat, barley, rice, maize, potatoes and horticultural crops (vegetables and fruits).

Currently, about 80% of the total irrigated area is occupied by cotton and wheat, and most Government efforts are aimed at increasing the productivity and production of these two major strategic crops. Bread wheat is an important food staple in Uzbekistan, which, during the Former Soviet Union era, was imported from other republics, including Kazakhstan. After independence in 1991, wheat became the second most important crop after cotton as part of a national “Self-sufficiency” campaign. Consequently, irrigated wheat area increased significantly from 0,63 million ha in 1991 to 1,1 million ha in 2025. During this period, average yield increased from 1,34 to 79,8 causing total production to increase from 0,95 million tons to 8,7 million tons [1; 2].

Picture 4.



Grain cultivation in Uzbekistan is divided into three zones: northern, central, and southern regions. The northern region includes the Republic of Karakalpakstan and Khorezm region; the southern region consists of Surkhandarya and Kashkadarya regions; while the central region comprises Tashkent, Syrdarya, Samarkand, Bukhara, Jizzakh, Navoi, Namangan, Andijan, and Fergana regions.

In Uzbekistan's conditions, wheat cultivation takes into account the soil and climatic characteristics of each region, which leads to differences in sowing times. In the northern region, under its specific soil and climate conditions, autumn wheat varieties are most effectively sown in September, while in the southern region, slightly later sowing-between October 20 and November 10 yields better results.

The table below presents the results of experiments conducted in the central region of the Republic of Uzbekistan regarding the cultivation of autumn wheat.

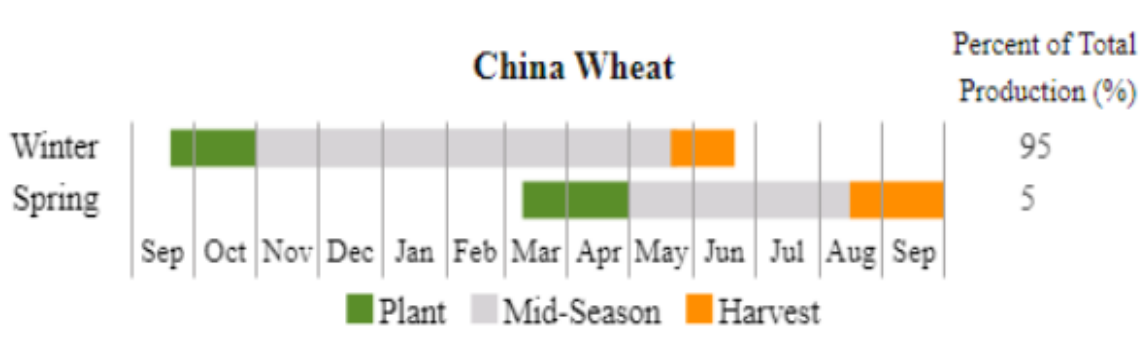
Table 4. Biometric parameters of local wheat varieties created in the last 5 years in the climatic conditions of the Republic of Uzbekistan

| № | Name of varieties of wheat | Plant stem height, cm | Maturation group | Vegetation period of the plant, day | Yield potential, s/ha | Tolerance to external factors | Tolerance to external factors | |
|---|----------------------------|-----------------------|-------------------|-------------------------------------|-----------------------|------------------------------------------------------|-------------------------------|---------------|
| | | | | | | | gluten content | type of grain |
| 1 | Ultra | 90-95 | earliest ripening | 190-195 | 100-110 | Tolerant to droughts, salinity and diseases | 30-31 | hard wheat |
| 2 | Sharof-100 | 80-85 | earliest ripening | 200-205 | 90-100 | Tolerant to droughts, salinity and diseases | 30-31 | hard wheat |
| 3 | Asr chilgisi | 80-85 | earliest ripening | 205-210 | 90-100 | Resistant to high temperature, salinity and diseases | 30-31 | hard wheat |
| 4 | Grad | 80-85 | earliest ripening | 205-210 | 100-110 | Resistant to high temperature, salinity and diseases | 30-31 | hard wheat |
| 5 | Khamkor | 90-95 | early ripening | 210-215 | 90-100 | Resistant to high temperature, salinity and diseases | 30-31 | hard wheat |

| | | | | | | | | |
|----|------------|--------|-----------------|---------|---------|------------------------------------------------------|-------|---------------|
| 6 | Baraka | 85-90 | early ripening | 210-215 | 90-100 | Tolerant to droughts, salinity and diseases | 30-31 | hard wheat |
| 7 | Oq yor | 95-100 | early ripening | 225-230 | 110-120 | Tolerant to low temperature and droughts | 27-29 | hardest wheat |
| 8 | Risq | 90-95 | early ripening | 225-230 | 110-120 | Resistant to high temperature, salinity and diseases | 28-30 | hardest wheat |
| 9 | Andijon 3 | 95-100 | early ripening | 225-230 | 100-110 | Resistant to high temperature, salinity and diseases | 27-29 | hardest wheat |
| 10 | Nodir | 95-100 | early ripening | 230-235 | 110-120 | Resistant to high temperature, salinity and diseases | 28-30 | hardest wheat |
| 11 | Aziz | 90-95 | early ripening | 230-235 | 100-110 | Tolerant to low temperature and droughts | 28-30 | hardest wheat |
| 12 | Qadr | 90-97 | Late-ripening | 240-245 | 100-110 | Tolerant to low temperature and droughts | 27-29 | hardest wheat |
| 13 | Qora daryo | 90-95 | Late-ripening | 240-245 | 110-120 | Tolerant to low temperature and droughts | 27-29 | hardest wheat |
| 14 | Ravnaq | 80-85 | middle-ripening | 240-245 | 110-120 | Tolerant to low temperature and droughts | 27-29 | hardest wheat |

According to the data of the Scientific Research work which held at the condition of Uzbekistan the yield potential of winter wheat varieties “Sharof-100”, “Asr ilgisi”, “Khamkor”, “Baraka” in the climatic conditions of Uzbekistan is 8.5-9.0 t/ha, “Ultra”, “Grad”, “Oq yor”, “Risq”, “Qora Daryo”, “Nodir”, “Ravnaq” varieties have the possibility of yielding 10.0-10.5 t/ha. These varieties are noted as strong and valuable varieties according to technological quality indicators of grain.

Picture 5.



In many countries around the world, wheat is typically cultivated and grown during the autumn and spring seasons. When analyzing the state of wheat production in the People's Republic of China, it can be seen that the majority of wheat (about 95%) is sown during the autumn season. In the 2015/2016 season, wheat was cultivated on 24,567 thousand hectares, yielding a total harvest of 132,555 thousand tons, with an average yield of 5.4 tons per hectare.

By the 2019/2020 season, although the area under autumn wheat cultivation had decreased by 839 thousand hectares compared to 2016, the total wheat harvest had increased by 1,045 thousand tons. The average yield during this period reached 5.63 tons per hectare.

Picture 6.

China: Wheat Production



USDA Foreign Agricultural Service
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Source: National Bureau of Statistics of China (data excluding Taiwan)
Average Wheat Production 2018-2020

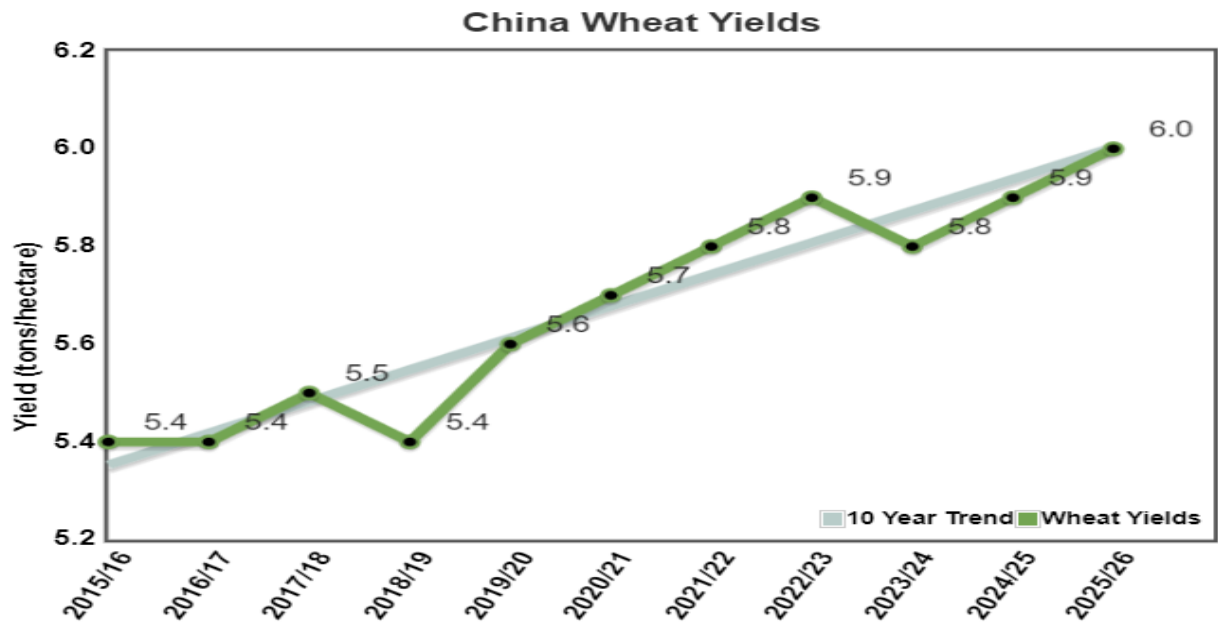
According to data obtained for the 2023/2024 season, the area under wheat cultivation in the People’s Republic of China was 23,627 thousand hectares, with a total wheat production of 136,946 thousand tons and an average yield of 5.81 tons per hectare.

Table 5. Wheat area, gross yield and average yield in the People's Republic of China

| Market Year | Area (1000 Ha) | Production (1000 Tons) | Yield (T/Ha) |
|-------------------------------------------------------|------------------|------------------------|------------------|
| 2015/2016 | 24,567 | 132,555 | 5.40 |
| 2016/2017 | 24,666 | 133,188 | 5.40 |
| 2017/2018 | 24,478 | 134,241 | 5.48 |
| 2018/2019 | 24,266 | 131,441 | 5.42 |
| 2019/2020 | 23,728 | 133,600 | 5.63 |
| 2020/2021 | 23,380 | 134,250 | 5.74 |
| 2021/2022 | 23,568 | 136,946 | 5.81 |
| 2022/2023 | 23,519 | 137,723 | 5.86 |
| 2023/2024 | 23,627 | 136,590 | 5.78 |
| 2024/2025 | 23,587 | 140,099 | 5.94 |
| 2025/2026 | 23,600 | 142,000 | 6.02 |
| 5-year Average 2020/21 - 2024/25 | 23,536 | 137,122 | 5.83 |
| Percent Change From 5 Year Average (%) | 0 | 4 | 3 |
| Record | 24,666 | 140,099 | 5.94 |
| Record Year | 2016/2017 | 2024/2025 | 2024/2025 |

PS&D Online updated on May 12, 2025

Picture 7.



It is important to note that in the 2024/2025 season, it is expected that wheat cultivated on 23,587 thousand hectares will yield 140,099 thousand tons, with the average grain yield projected to reach 5.94 t/ha. Furthermore, for the 2025/2026 wheat production season, a priority goal has been set to increase the total production to 142,000 thousand tons and raise the average grain yield to 6.02 t/ha through the application of advanced innovative technologies and the cultivation of high-yielding wheat varieties.

Conclusion. In 1991, when the Republic of Uzbekistan gained independence, its population was 20.2 million people. By 2024, the population had reached 36.8 million, and according to 2025 statistical data, it amounted to 37.8 million people.

In the People's Republic of China, the population was 710 million in 1960, over 987 million in 1980, 1.25 billion in 2000, and, according to data for 2025, it stands at 1,416,338,493 people.

After gaining independence in 1991, wheat became the second most important crop after cotton within the framework of a national “self-sufficiency” campaign. As a result, the area of irrigated wheat cultivation significantly increased from 0.63 million hectares in 1991 to 1.1 million hectares in 2025. During this period, the average yield rose from 0.13 t/ha to 7.9 t/ha, and total production increased from 0.95 million tons to 8.7 million tons.

The above-analyzed data shows that significant scientific and practical achievements have been made in the field of grain production in both the Republic of Uzbekistan and the People's Republic of China.

Scientists from both countries have developed wheat varieties that are resistant to unfavorable climatic conditions and of high quality, and the seed production systems have been properly organized.

At the national level, both countries have given considerable attention to the development of the grain sector and have implemented advanced scientific and practical measures.

The application of modern, resource-saving innovative technologies in grain farming has proven to be highly effective.

In the near future, we express hope that through collaboration between TSAU and NWAUFU scientists from both countries, the creation and seed production of wheat varieties resistant to drought, salinity, heat, cold, and various diseases, along with the implementation of water-saving irrigation technologies, smart agriculture and Integrated Pest Management (IPM), will bring high

efficiency and ensure a stable supply of wheat products to meet the population's growing demand.

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