

## STUDY THE IMPACT OF PREVIOUS CROP TO WINTER WHEAT HARVEST

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<https://doi.org/10.5281/zenodo.10246333>

**Abstract.** *In this scientific article, the effect of previous crops on the yield of winter wheat variety "Chillaki" in the conditions of irrigated typical gray soils of Tashkent region is studied. The effect of predecessor crops on the duration of the development phases, biometric indicators and productivity of this variety was observed, and it was scientifically explained and explained that the optimal predecessor crop type for obtaining a higher grain yield (59.6 t/ha) than the local "Chillaki" variety of winter wheat is soybean.*

**Keywords:** *wheat, grain, variety, crop, soil, predecessor crop, development phase.*

Usage. Wheat is the main cereal crop in the world. Wheat is the most common and widely used crop. Wheat is used as a food crop, grain is used to produce cereals, bread and other bread and bakery products are baked from wheat flour (breads, buns, crackers, cookies, biscuits, donuts, pancakes, muffins, waffles, noodles, pasta, ice cream, spaghetti, puddings etc.). Bread products are distinguished by good taste, sufficient calorie content. A person for his life activity gets up to 20% of his energy from wheat, 21% from rice, and then from corn and potatoes. The taste, caloric content and nutritional value of wheat products depend on the chemical composition of the grain (Table 1).

**Table 1. The chemical composition of wheat, %**

Components	Water		Flour Extraction	
	Whole grain	Only germ	72%	80%
Raw protein	13.3	26.6	11.8	12.0
Fat	2.0	10.9	1.2	1.3
Minerals	1.7	4.3	0.46	0.65
Cellulose	2.3	2.5	0.40	0.65
Other carbohydrates	68.7	44.2	74.1	73.6
Water	12.0	11.5	12.0	12.0

Chemical composition of the grain is variable. It depends on many factors. The presence of essential amino acids is the value of wheat protein. In addition to proteins, wheat grain contains a protein substance – gluten, thanks to which bread products are baked. Wheat is necessary food for the millions of people who lives in the globe, and for a larger number of people the wheat is only product for living.

Wheat is used as a raw material for the processing industry, starch and alcohol are produced from it. Various items for construction is produced from straw. Wheat grain and milling waste are used to produce animal feed. Wheat fodder varieties and hybrids are used as green fodder for all animal species.

History. A man from prehistoric times uses wheat for food. Initially, its grain is used in fried form. In the Middle East wheat is being used for 12 - 17 thousand years ago. In the Western Hemisphere, wheat has been widely used for over 4,000 years, and in the Eastern Hemisphere it is difficult to say for sure when people could live without wheat. In the area between the Tigris and the Euphrates, wheat ensured the existence and flourishing of civilization. For thousands of years and hundreds of generations, the existence of man himself and his animals depended on wheat – these are the scientists' assumptions.

The general area of distribution of cultivated wheat is huge and covers all continents of the globe. The wheat is found in the mountains areas of northern Sweden and southern borders of Africa and Australia. However, wheat is mainly a steppe crop. On the territory of the CIS, it occupies steppes and forest-steppe, in North America – prairies, in South America – Pampa, in Australia – steppe and semi-desert areas.

Many types of wheat is originated from Central Asia and South Caucasian region. Many varieties of bread wheat have been discovered here. Wheat was known in the countries of Middle East for 7-6 thousand years BC, in Greece and Bulgaria – for 6 - 5 thousand years BC. On the territory of Uzbekistan, wheat was known about 6 - 5 thousand years in the Fergana Valley and Khorezm.

Today, wheat is cultivated in all continents of the world (Table 2).

*Table 2. Wheat production, 2021*

Country	Millions of tonnes
 <a href="#">China</a>	136.9
 <a href="#">India</a>	109.6
 <a href="#">Russia</a>	78.1
 <a href="#">United States</a>	44.8
 <a href="#">France</a>	36.6
 <a href="#">Ukraine</a>	32.2
 <a href="#">Pakistan</a>	27.5
World	771
Source: <a href="#">UN Food and Agriculture Organization</a>	

An incomplete list of wheat cultivation areas confirms its wide distribution. The size of the yield of the continent, the countries differ quite significantly, it speaks of the level of agricultural crop, the development of agronomical science, the use of modern technology of cultivation of wheat.

Currently, Uzbekistan pays special attention to the production of wheat grain. In recent years, Uzbekistan produced around 7-8 M tons of wheat grain annually thanks to the measures taken by the GoU.

Systematics. Wheat belongs to the family *Poaceae*, to the genus *Triticum. L.*, which combines many species. The composition of the species varies. So far it is considered that there are 27 cultivated and wild types of wheat. Many types of wheat originated by natural hybridization and from the genus *Egilops*. Among these species, soft and durum wheat are the most common.

Bread wheat (common) – *Tr. aestivum L.* – is the most flexible in all its properties in comparison with other species. Bread wheat is sown from arctic to the southern hemisphere. The species has 100 types. The main features are: spikes awned and awnless, haired and hairless, spike length 5-15 cm, the front side of the spike is wider than the side. The ears are loose and dense, the density is  $D = 10 - 38$ . The duration of the stage of vernalization is different, and there are winter, facultative and spring forms. The number of nodes is 4-7. It develops well with a long light day. In northern wheat, awn brittle, thin, in southern – dense, coarse, non-friable. There are furcate forms (small ruminants are formed instead of awns). The spike hairiness often depends on environmental conditions during the passage of 6 - 7 stages of organogenesis (humidity of air and soil).

Soil fertility plays an important role in the production of high-quality grain crops. Ensuring the stability of agriculture by maintaining and increasing soil fertility, reducing dependence on unfavorable natural and climatic conditions is one of the important current issues of the present time.

Analyzing the information provided in scientific sources, it is possible to obtain detailed information about which agrotechnical measures to pay more attention to, the periods and methods of their implementation, as well as which crops to plant and feed in areas freed from winter wheat to ensure a high-quality grain harvest. allows.

The aim of research - The purpose of this study is to study the influence of previous crops on the yield of winter wheat "Chillaki" in the conditions of irrigated typical gray soils of the Tashkent region.

The methodology. Scientific research work was carried out in the agricultural scientific research and educational experimental farm of Tashkent State Agrarian University during 2019-2020. The experimental farm is located in the upper reaches of the Chirchik River, at an altitude of 481 m above sea level.  $41^{\circ} 11''$  in the northern latitude and  $38^{\circ} 31''$  It is located in the eastern distance in Qibrai district of Tashkent region.

The experimental farm is 1500 meters away from the university yard, it is bordered by the Salar stream on the east side, Boz water canal on the west side, the hospital of Tashkent PTI on the south side, and the residential area on the north side.

The soil of the experimental farm is a typical gray loam that has been irrigated for a long time. This soil contains 0.8 - 1.0% humus, about 0.058 - 0.089% nitrogen, about 0.141 - 0.184% phosphorus and about 0.154 - 0.148% potassium. The soil is not saline. It differs in soil water permeability, softening complexity.

Groundwater is located in a layer deeper than 3 m. Water from the Boz water channel flowing from the northern part of the experimental farm was used for irrigation.

***Preliminary agrochemical parameters of experimental field soil***

Soil layer, cm	Common forms of nutrients, %			Mobile forms of nutrients, mg/kg		
	Hummus	Nitrogen	Phosphorus	N-NO <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
0-30	0,920	0,083	0,152	4,7	47,1	180,7
30-50	0,715	0,065	0,134	3,1	40,3	140,0

The main part of the conducted research work is to study the growth, development, and grain yield indicators of winter wheat after sowing wheat after winter wheat, as well as repeated crops: corn and soybeans.

The experiment consisted of 3 options, the area of each option was 240 m<sup>2</sup>, of which the area to be considered was 120 m<sup>2</sup>. Experiments were carried out in 4 replications under field conditions. In the experiment, the "Chillaki" variety of winter wheat created in Uzbekistan was planted.

The following phenological observations, calculations, and laboratory analyzes were carried out in the experiment:

1. The level of grain germination was observed in all variants of experimental repetitions;
2. The number of lawns, seedling thickness per 1 m<sup>2</sup> was determined at 4 points of all options;
3. Phenological observations - germination - weeding; accumulation; tube spike; bloom; periods of ripening (milk, wax, full) - were carried out in the plants;
4. Winter wheat: number of bushes; total number of stems; the number of productive stems was observed in 1 m<sup>2</sup> area at 4 points of all variants of the experiment;
5. The following were found in 120 plants in each option:
  - stem height of winter wheat (in the periods of sprouting, earing and full ripening);
  - spike length (during full ripening);
  - the number of grains in one spike; grain weight in one spike;
  - weight of 1000 grains;
6. During the harvesting period, wheat in 1 m<sup>2</sup> was harvested from 4 points of repetitions of all options in the experiment, the grains were crushed and the yield of grain and straw was calculated by weighing on a scale;
8. It was recommended to produce suitable options.

The result and analysis. It is known that, regardless of any type of crop, in order for the seeds to germinate on time, the soil must have sufficient moisture, temperature, light and other external factors, and the quality of the seeds must be high. In the experiment, the influence of repeated crops on the dynamics of winter wheat germination was studied.

The data is presented in Table 4 below. When analyzing the table data, it was observed that the effect of repeated crops on the germination rate of spring wheat is significant.

According to the data obtained in the experiment, rapid germination of seeds was observed in the variants planted after soybeans, and it was 18.1% in the variant planted five days after the seed water was given to winter wheat at a rate of 200 kg.

After 10 days from the day of seed watering, when these indicators were determined in the planted varieties, it was 53.7%. Full germination of the seeds was observed after 15 days, and it was observed that 88.5 - 92.8% of sprouts were formed.

Field experiments showed that winter wheat germination was slightly lower in variants planted after corn. At the initial follow-up, it was 17.6%. Ten days after the seed water was given, this indicator was 53.2%, and fifteen days later - 92.4%.

**4-table**

***Germination dynamics***

№	Options (name of predecessor crops)	Dynamics of seed germination, %				
		19.X	22.X	25.X	28.X	1.XI
1.	Control	18.6	32.1	57.0	78.1	93.3
2.	Corn	17.6	30.5	53.2	75.1	92.4
3.	Soybean	18.1	31.0	53.7	75.0	92.8

Many experts have emphasized that the level of productivity of winter wheat depends on the length of the spike, the number of grains formed in it, and its weight. As we know, earing begins with the appearance of a spike in the leaf axil at the top of the main stem.

According to the results of scientific research, the influence of repeated crops on the biometric indicators of winter wheat was observed. For example, according to the information on the length of the ear of winter wheat, the number and weight of grains in one ear, in the options planted after the shade - the length of the ear is 10.3 cm; if the number of grains in one spike was 40.8 and the weight of grain in one spike was 1.31 g, we can see that these indicators are superior to the control option.

Information on the length of the ear of winter wheat "Chillaki", the number of grains in the ear, the weight of 1000 grains in one ear, grain yield is presented in Table 1.3.

**5-table**

***Winter wheat ear length, number of grains in one ear and weight,  
1000 grain weight and grain yield indicators***

№	Options (name of predecessor crops)	Spike length, cm	The number of grains in one ear, pcs	Grain weight in one ear, gr	1000 grain weight, Gr	Grain yield, ts/ha
1.	Control	9.8	38.4	1.32	34.3	50.2
2.	Corn	9.7	39.6	1.22	30.8	47.3
3.	Soybean	10.3	40.8	1.31	32.1	59.6

Conclusion : Analyzing the data of Table 5 above, the grain yield in the control option was 50.2 tons/ha. The repeated crops studied in the experiment affected the yield of winter wheat as follows: in option 2, when planted after corn, the grain yield was 47.3 t/ha, that is, 2.9 t/ha less than the control, and in option 3, it was 59.0 t/ha that is, when we compare it to the control variant - we can see that a higher yield of 8.8 t/ha was obtained. In the experiment, the yield of straw was also determined, according to the options - 63.5-58.8-76.0 ts/ha.

In conclusion, it was noted that soybean is the optimal predecessor crop type for obtaining a high grain yield from the local "Chillaki" variety of winter wheat in the conditions of Tashkent region.

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