

## **Current Status and Development Prospects of Winter Wheat Varieties Planted in the Bukhara Region**

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**Annotation:** This article provides information about the winter wheat varieties found in the Bukhara region. Winter wheat is a grain crop resistant to cold and characterized by high productivity. It is typically sown in the autumn and harvested in the summer of the following year. It has a longer growing season compared to spring wheat, producing a more abundant harvest and higher grain quality.

**Key words:** wheat, grain, Krasnodar, Tanya, Vassa, Asr, Moskvich, Pamyat, Kuma

Wheat belongs to the Poaceae (grass) family and is a herbaceous plant. There are about 30 wild and cultivated species. The root system is primarily fibrous and is found in the plowed soil layer, with some roots reaching lengths of up to 180 cm. The stem is a hollow straw, and its height can reach 40–130 cm.

In developed countries, the following principles are followed to obtain high yields from grain crops and to protect them:

### **Daily monitoring of crops**

Observing growth characteristics, activity of entomophages (insect predators), and expected weather conditions

Use of agro-technical methods and other control measures

Nowadays, due to abrupt climate changes, there is a noticeable decrease in grain crop yields, increased susceptibility to pests and diseases, drought, and soil salinization. Therefore, the main goal of plant breeders is to develop grain varieties adapted to such specific climatic conditions.

Wheat, in turn, is sown at two different times depending on the climate: in spring and in autumn. The growing season of winter wheat includes 45–50 days in autumn and 75–100 days in spring-summer, while for spring wheat, it is 90–100 days.

The development stages of wheat include several phases. The growth stages of winter wheat are as follows: germination, tillering, stem elongation, heading, flowering, and ripening.

**Germination:** Moisture is the main factor necessary for the germination of seeds. To enhance germination, attention should be paid to:

The variety of the plant being sown

Seed characteristics

Chemical composition of the seed

Soil concentration

During germination, the seed absorbs 54–57% of its weight in water, initiating the respiration process in the embryo. The radicle and leaves emerge from the embryo.

Tillering stage: This is the stage when the wheat stem branches underground. The node from which lateral shoots and secondary roots develop is called the tillering node. It is one of the most crucial parts, as it stores nutrient reserves. The resistance of the wheat plant to cold and drought depends on the position of this node. A distinctive feature of tillering is that multiple stems can grow from a single seed.

Stem elongation stage: This follows the tillering stage. After the plant forms a hollow stem (internode), it begins to grow intensively. This stage is very important and is referred to as the "critical period," during which sufficient water and nutrients must be supplied. The yield potential of wheat largely depends on this period.

Heading stage: This begins when the inflorescence starts forming. In winter wheat, the period from stem elongation to heading lasts about 20–25 days.

Flowering Stage – This stage follows the heading stage and begins 4–5 days afterward. Flowering is especially active in dry weather during the early morning and evening hours. During flowering, the middle part of the spikelet blooms first, followed by the lower end and finally the upper part. The initially blooming section accumulates more nutrients than other parts, which is why the grains in the middle part of the spike tend to be larger. The optimal temperature for winter wheat flowering is between 15–26°C. When the air temperature exceeds 35°C, pollination becomes less effective, resulting in underdeveloped (sterile) grains.

After fertilization, nutrients accumulate in the ovary, gradually forming the grain. The grain elongates and reaches its typical size for the variety, accumulating nutrients. These nutrients are transported to the grain from the leaves and stem in the form of amino acids and monosaccharides, and are then converted into water-insoluble compounds. Once these processes are completed, the ripening stage begins.

Ripening Stage – This stage is divided into three phases:

Milk ripeness

Dough (wax) ripeness

Full ripeness

Due to the hot and dry climate of the Bukhara region, winter wheat varieties such as Krasnodar, Tanya, Vassa, Asr, Moskvich, Pamyat, Kuma, Pervitsa, and Brigada are cultivated in this area.

### **Variety “PERVITSA”**

Authors: L.A. Bespalova, O.Yu. Puzirnaya, A.V. Novikov, V.R. Kerimov, Ye.V. Agaeva, S.V. Tarasko, I.B. Ablova, I.N. Kudryashov, G.I. Bukreeva, V.I. Efremenkova

This variety belongs to the Iutescens subtype, is a biological winter, soft wheat.

Growing season: 230–235 days

Plant height: 80–85 cm

Thousand kernel weight: 40–42 grams

Grain protein content: 14.5%

Gluten content: 28.9%

Potential yield: 90–95 centners/hectare

The variety is resistant to cold, drought, powdery mildew, and strong leaf rust, and moderately resistant to yellow rust and brown rust.

Seeding rate: 4.0–4.5 million seeds per hectare

Sowing time: Optimal period selected for the region

Status: Included in the State Registry as a promising variety in the Republic

Variety Catalogue:

Variety name: Pervitsa

Type: Soft wheat (*Triticum aestivum*)

Subtype: Iutescens

Growth type: Winter

Maturity group: Medium

Plant growth habit: Erect

Plant height: Semi-dwarf (80–85 cm)

Spike: Awnless

Spike color: Colored (yellow)

Spike shape: Cylindrical

Spike density: Dense (compact)

Awn length at spike tip: 2–3 mm

Terminal internode of the spike rachis: Filled

Grain shape: Ovoid

Grain color: Colored (red)

Grain brush hair length (seen from dorsal side): medium



*Field sown with Pervitsa soft wheat in Image 1.*



*Ear length of Pervitsa wheat in Image 2.*

#### **Variety “BRIGADA”**

Authors: L.A. Bespalova, O.Yu. Puzyrnaya, A.V. Novikov, V.R. Kerimov, I.B. Ablova, I.N. Kudryashov, G.I. Bukreeva, V.I. Efremenkova, N.P. Fomenko, L.P. Flibok, N.I. Lysak. This variety belongs to the Iutescens subtype, is a biological winter, soft wheat.

Growing season: 230–235 days

Thousand kernel weight: 38–42 grams

Grain protein content: 14.5%

Gluten content: 28.5%

Potential yield: 90–95 centners/hectare

The variety is highly resistant to cold, drought, powdery mildew, and strong leaf rust. It is moderately resistant to yellow rust and brown rust.

Seeding rate: 4.5–5.0 million seeds per hectare

Sowing time: Optimal period selected for the region

Status: Included in the State Registry as a promising variety in the Republic

Variety Catalogue:

Variety name: Brigada

Type: Soft wheat (*Triticum aestivum*)

Subtype: Iutescens

Growth type: Winter

Maturity group: Medium

Plant growth habit: Erect

Plant height: Medium (85–90 cm)

Spike: Awnless

Spike color: Colored (yellow)

Spike shape: Cylindrical

Spike density: Dense (compact)

Awn length at spike tip: 5–7 mm

Terminal internode of the spike rachis: Filled

Grain shape: Ovoid

Grain color: Colored (red)

Grain brush hair length (viewed from the back): Medium

#### **ASR VARIETY:**

Created by hybridizing the varieties Kroshka and Oruval, followed by two rounds of individual selection. It is a medium-ripening variety with a plant height of 95–105 cm. The spike is awnless, cylindrical, large, 8–10 cm long, and white in color. The grain is large, red, elongated in shape, with a thousand-kernel weight of 42–43 grams. The grain test weight ranges from 790 to 830 g/L. When ripened, the spike tends to bend over. Under regional conditions, the highest yield is 60–62 quintals per hectare.

The variety has moderate resistance to rust diseases, including yellow rust, brown rust, and powdery mildew.

Optimal sowing time: From September 25 to October 30.

Recommended seeding rates:

For mid-season sowing (September 25 to October 15): 4.5–5.0 million viable seeds per hectare.

For late sowing (October 20 to October 30): 5.0–5.5 million viable seeds per hectare.

Fertilization schedule:

In autumn, after germination: 100 kg/ha

In early spring, during the tillering stage: 200 kg/ha

During the stem elongation stage: 200 kg/ha

During the heading–flowering period (April 1–20): 100 kg/ha

#### **Conclusion:**

Winter wheat varieties are typically sown during September and October and harvested in the summer of the following year. These varieties grow rapidly in the spring season. The winter wheat varieties found in the Bukhara region are adapted to saline soils and the hot, dry climate. They are considered high-yielding and productive.

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