**BREEDING AND SEED-FARMING OF WINTER WHEAT IN SIBERIA**

**Description**

Winter wheat has many advantages over spring wheat. The introduction of winter wheat into the farming standards of the Ural-Siberian zone of Russia makes it possible to avoid the harmful consequences of spring-summer droughts, ensures 35-40 days earlier ripening, modifies the technology of tillage, etc.

The developed winter wheat cultivars (Kulundinka, Bagrationovskaya, Lutescens 4, and Zalarinka) excel the winter wheat cultivars from the VIR World Wheat Collection in winter hardiness. They are distinguished by stable wintering in forest-steppe and steppe zones of Siberia, high crop capacity (twice as much as that of spring wheat), high grain and flour technological properties.

Kulundinka cultivar is characterized by stable winter hardiness in the dry-steppe areas of eastern Kazakhstan; yields 34-40 centner per hectare; is resistant to drought and logging; the weight of 1000 grains is 28-31 g; the wet gluten content is up to 35 %; good baking properties of the flour, the flour strength is 207 a.u. The cultivar was developed in cooperation with the North-Kulunda Experimental Station.

Lutescens 4 is a wheat cultivar of intensive type resistant to logging; weight per 1000 grains is 38-45 g, good and excellent baking properties; the protein content is 14.5 %; the wet gluten content is 30 %; the flour strength is 430 a.u.; yield is 36-43 centner per ha.

Bagrationovskaya 4 is a wheat cultivar of intensive type resistant to drought, logging and grain falling; the weight per 1000 grain is 38-42 g; the yield is up to 51.8 centner per ha; excellent baking properties; the wet gluten content is 33%; the flour strength is 368-378 a.u. The cultivar was developed in cooperation with the East-Kazakhstan Experimental Station.

Since 1996 the cultivar has been accepted as a winter hardiness standard of wheat cultivars.

Novosibirskaya 32 is a wheat cultivar of intensive type produced by hybridization of inbread clones of purple wheat-grass with winter common wheat cultivars for cultivation in the forest-steppe zone of Siberia. It is suitable for modern cultivation technologies, mechanized harvesting and processing. Plants have semi-decumbent stems of average hardness, pyramid-shaped spike; the weight per 1000 grains is 336 g; the wet protein content is 13.8 %; the average grain yield is 33.5 centner per ha.

According to their baking properties, the cultivars are considered among strong cvs.
Technical appraisal and economic benefits
The winter wheat cultivars have a number of advantages over spring wheat for Siberia:

1) winter wheat sowings for the yield of 35-40 centner per hectare satisfy up to 70-80 % of their moisture needs at the expense of winter precipitation, whereas for spring wheat this index is 15 % for spring wheat. Thus, winter wheat does not suffer or resist spring - early-summer droughts, which occur each 7 out of 10 years in the Ural-Siberian region;

2) winter wheat sowings ripen and are ready for harvesting in late July – early August when weather conditions are more favorable than in September-October when spring wheat is harvested. Therefore, higher quality grain of winter wheat is obtained without extra energy consumption;

3) harvesting winter wheat in mid-August allows the land to be plowed for spring sowings in August. The resulting winter tillage is half-fallow, which increases the yield of spring crops in the next year. Thus, winter wheat are a very convenient and economically profitable precursory in rotation of crops;

4) cultivating winter wheat in the zone with short summer restricted by natural factors enables a considerable reduction in the field work load during spring sowings and autumn harvesting;

5) economic advantages of this crop for the land-farming in the Ural-Siberian zone consist in the reduction of the grain price by 30-40% as compared to the spring wheat, i.e., twice or thrice cheaper.

Application areas
Agriculture

Development stage
Full-scale production. The produced cultivars have passed the State Cultivar Tests and are recommended for cultivation in West-Siberian, East-Siberian and Ural regions.

Patent situation
The cvs are protected by authors’ certificates.

Commercial offers
Agreements on seed supply.

Estimated cost
To be negotiated.

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