Laboratory of Winter Bread Wheat Breeding, 7 Toulaikova St., Saratov, 410010, Russian Federation.

The winter wheat cultivar Kalach 60.

J. Svistunov, A. Pryanichnicov, A. Zavorotina, A. Sergeeva, V. Uvarova, and N. Larionova.

Breeding of the winter wheat cultivars at ARISER began in 1915. The main task in the first stage of selection was creating cultivars adapted to the steppe zone of the Volga Region. Since the beginning, 26 cultivars have been developed from which seven are currently patented and registered.

Kalach 60 is an intensive type cultivar; to obtain high yield and high-quality grain, it requires the application of fertilizers and observing agronomical practices. Kalach 60 was developed using individual selection. The cultivar is of the variety lutescens. Plant height is 20–30 cm shorter compareed to that of Mironovskaya 808. The straw is thick. Kalach 60 has increased winter hardiness, lodging and drought resistance, early mature growth, high grain quality, and high grain yield (2.7 t/ha). These characters allow the use of Kalach 60 in intensive farming to obtain high-quality grain. Early ripening allows Kalach 60 to be used in a system used by large farms, which sow winter crops on large areas.

In 2011, Kalach 60 was planted in rhe Saratov region on 13.7 x 10^3 hectares (2.8%). In 2012, it was listed in the National Register of the Russian Federation in the lower Volga Region.

RESEARCH DEPARTMENT OF "AGROPARK"
Gostynichnaya , 4B Moscow 127106, Russian Federation.

The role aluminum salts ($AlCl_3$, $Al(NO_3)_3$, and $Al_2(SO_4)_3$ in the formation of spring wheat resistance to aluminum toxicity.

N.V. Poukhalskaya, Y.R. Ziangirova, and F.D. Davadov, and N.I. Pavlova (Pryanishnikov All Russian Research Institute of Agriculture and Solid Science, Pryanishnikova, 31. Moscow 127550, Russian Federation) and S.L. Ignatyeva (Russian State Agrarian University – MTAA named after K.S. Timiryazev).

We are researching the toxicity of aluminum, at present, because of insufficient data about the toxicity of various Al^{+3} salts (sulfates, nitrates, and chlorides). Our data show that aluminum toxicity changes in the presence of different ions. We studied the comparative degree of toxicity of aluminum ions when using sulfates, nitrates, and chlorides on spring wheat.

Materials and methods. Aluminum tolerance was observed at germination in laboratory experiments under controlled environmental conditions. Seedlings of two cultivars of spring wheat were grown under greenhouse conditions. Sprouts of plants were grown on solutions of $AlCl_3$, $Al(NO_3)_3$, and $Al_2(SO_4)_3$ with various concentration of aluminum (0, 0.4, 3, 5.13, 15, and 40 mg of Al/L. Absorption from the solutions was measured in vessels each containing the same number of plants. Plants were grown on plastic floats (rafts) on the surface of the solution. The seed was planted in apertures in the floats. Experiments also were made in rolled culture and in soil. The same aluminum salts were used at 1.3 mg/100 g soil for the vegetative trials.

Results and discussion. During germination, wheat plants reduce the absorption from solutions in different ways. Absorption decreases as follows: $Al(NO_3)_3 = Al_2(SO_4)_3 > AlCl_3$. Plants absorb a solution more actively if there are ions that do not interfere with metabolism, but apparently, more active absorption of a 'bad' aluminum ions also occurs.

Effects of aluminun toxicity. The root tip is deformed (Fig. 1, p. 213). The root becomes thickened; cell division continues but the stretching processes slow down. Our results show that growth in root tips is connected with the ability to