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GENETIC DETERMINATION OF THE NITROGEN SUPPLY OF SPRING WHEAT (TRITICUM AESTIVUM L.)

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The maximum grain productivity can be achieved only taking into account plant biological needs. The need in mineral nutrients depends on the plant hereditary nature and environmental conditions. The greatest demand for nitrogen is characteristic in cereals for spring and winter wheat, the lowest one for barley and rye. The use of mineral nutrients in amounts exceeding plant needs does not result in yield increasing and can worsen the production quality. We were studying reaction of spring bread wheat (*Triticum aestivum* L.) genotypes to changes in nutrition soil conditions. In the experiment, ITMI mapping population consisting of 110 recombinant inbred lines was evaluated for a number of morphological, biological and economically important traits under different levels of the nitrogen supply. To create different soil nutrition level and to prevent leaching of fertilizers during the plant vegetation season we prepared trenches with depth 0.4 m, width 1 m and length 20 m; the bottoms of which were covered with plastic films. The trenches were filled with soil from the lower soil horizons. In first variant of the experiment, nutrient mixture on the basis of the physiological rate for cereals (N – 0.15 g, P - 0.1 g, K - 0.1 g of active substances per 1 kg of dry soil) was applied. In the second variant, nitrogen dose was reduced half with the same phosphorus and potassium doses. Variant without fertilizers applying was used as a control. Thirty nine characters were analyzed during the all growing season. The combination of field and vegetation experiment conditions allowed approximating maximally to real conditions of the experiment and at the same time to control strictly plant vegetation. QTLs identified in our study can be differentiated as dependent and independent on environmental conditions. For example, some QTLs controlling such traits as a wax bloom, phenological phases, *etc.* are stable under different conditions of soil nutrition. QTLs of traits determining the yield structure were unstable and changed their locations on chromosomes under different conditions of nitrogen supply. The most of identified QTLs changed their locations at different nitrogen doses, and in some cases additional QTLs were found which also influenced to a particular trait expression. The activity of genes blocks determining the physiological and morpho-agronomical and biological quantitative traits was experimentally shown to depend on the mineral nitrogen doses. Identification of chromosomal loci involved in the nitrogen metabolism allows planning more accurately breeding programs directed to increase the plants productivity.