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Spring wheat mutation resource for high yield associated traits and enriched grain protein and iron under drought conditions

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Mutated spring wheat along with parent variety was used to evaluate effect of drought on grain quality and yield-associated traits. To generate genetic variety in the population, seeds of spring wheat cv. Almaken were γ -irradiated with 100 doses from a ⁶⁰Co source. Identifying new genetic sources and quantifiable traits would facilitate the crop improvement for drought tolerance. Promising advanced M7 mutant lines were obtained and evaluated for nutritional grain characteristics yield associated traits such as grain weight per spike (GWS) and grain number per spike (GNS) and thousand grains weight (TGW) and under irrigation and rain-fed conditions. Fifteen field-grown lines were studied. Under irrigation, most of lines showed significant increases in grain protein content with high, GPC and iron concentration were identified as having 10.8-11.6% and 1.32-1.69 times, respectively, greater concentrations than parent variety. Under rain-fed conditions, only some mutant lines with significantly higher GPC than parent variety were registered. Although drought significantly affected ranking genotypes, the main trend in the accumulation of iron to reduce its concentration. A few mutant lines were identified for their advantage over parent, showing no decline or increase in its concentration and indicating about their relatively independent genotypic response to stress on this grain quality characteristic. Under rain-fed conditions, in mutant lines GPC was significant positively correlated with GNS and grain Fe concentration with GWS. The results indicate high genetic potential of mutant lines to improve grain Fe concentration and GPC and drought tolerance in cultivated wheat.

Biography

Kenzhebayeva Saule has completed her PhD from Moscow State University named after M.V. Lomonosov and Postdoctoral studies from Kazakh Research Institute of Physiology, Genetics and Bioengineering, Kazakhstan. She is the Professor of Kazakh National University named after al-Farabi. She has published more than 20 papers in reputed journals.

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